D^R CUTLER'S

NOTES ON SPA

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NOTES ON SPA.

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NOTES ON SPA

AND ITS

CHALYBEATE SPRINGS,

BY

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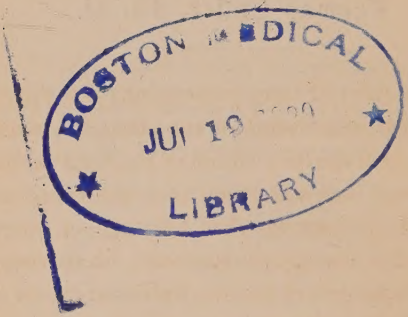

PREFACE.

At the request of many patients and at the instance of the principal inhabitants of the place, the author published in 1849 the first edition of his *Notes on Spa*.

Presuming that something else was required for invalids of the present day than the kind of information offered by his literary predecessors, he endeavoured to present the subject of the SPA waters under an entirely new aspect, but with every possible regard to clearness and conciseness. The task was difficult from its very nature, as, in the endeavour to enlighten the invalid, there is always the fear of encountering, in such writings, the disdain of the learned members of the profession, to whom a popular style and phraseology is generally foreign and unpalatable; yet the double object had to be attained of interesting both. With all its imperfections the work was favourably received, as evinced by the new and high professional patronage the place has

since acquired and, correlatively, by the immense increase of visitors.

He ventured to offer some remarks upon resources possessed by SPA hitherto unnoticed, and humbly suggested to the municipal council the necessity of giving them the consideration their importance merited, persuaded that their full developement would not only confer a real blessing on a large class of sufferers, but would tend at the same time to favor the best interests of the inhabitants themselves. Several of these suggestions have been acted upon; the rest are, at this moment, subjects of serious deliberation both with the town council and the central Government of Belgium, for which reasons they have not been reproduced in the present edition; public opinion has been so strongly pronounced upon the matter that, happily, there is no reasonable doubt now entertained as to the result. The consummation of these desirable ends, amongst which the foundation of a noble edifice to serve as a pump-room and establishment for baths occupies a prominent place, will restore to SPA its former splendor and renown, and more than requite the author for his long and arduous efforts in so important and interesting a cause.

APHORISMS.

1. The salutary effects of mineral waters can only be brought about by their steady employment; precipitation not alone hinders the cure, but almost invariably aggravates the previous morbid condition. (WURZER.)

2. On arriving at a watering-place in search of health, consider you are entering the Temple of Esculapius; leave at the door all agitating passions, all affairs which have long harassed the mind. (ALIBERT.)

3. At a watering-place the invalid must be resolute not only with respect to his diet, but to his entire habits. It is far better that he go through his course of waters with serious formality than with frivolous gaiety; whosoever looks forward to a cure must earnestly desire it, and thus will he gain his object. He who continually hesitates between what is injurious and what conducive to his health will not attain his end, he prefers to suffer and cares but little how much he disheartens his physician. (MARCARD.)

4. Whosoever fancies he has done enough when during

the treatment he has observed a strict regimen, and that in emptying his last glass of the spring he may cease to concern himself about his mode of living; to him it may be said: At this price is thy health not to be purchased! (*Idem.*)

5. Mineral waters lay no insignificant hold upon the organization. Medication, of whatever kind, serves not to nourish the body, but to effect therein certain changes which can only be salutary when rightly directed towards combating disease. However great may be the health-restoring qualities of a mineral spring, when selected by the physician with intelligent discrimination, this very water will produce injurious consequences when the patient, without sufficiently valid reasons, and following merely his own erroneous impressions, experiments with it upon himself. (Von Ammon.)

6. Nothing is more prejudicial to an invalid than to act up to the belief that his own case forms an exception to the regimen necessary to be observed in a mineral-water cure. (*Idem.*)

7. The invalid should come with full confidence to the appropriate springs. Let him prepare himself for the use of the waters with moderation and foresight, and not indulge in the conceit that these, like a plenary indulgence, can wash out all his former misdoings! Let him not rush from spring to spring, acting only upon inconsiderate impulse, but rather let him make himself thoroughly acquainted with all the requisites for a successful water-cure and sedulously follow the advice and dietetic rules offered him by his physician. (*Idem.*)

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I

Town, climate and neighbourhood.

Spa, one of the most charming and frequented watering-places on the continent of Europe, is situated in the delightful valley of the Wahai, a small stream which passes through the town and which, continuing to meander among picturesque ravines and richly wooded hills, mingles at length its ripples with those of the river Vesdre.

The valley, near the town itself, expands towards the south as far up as the woods which skirt the *fanges* or moors, and the slopes thus formed, richly diversified by corn and meadow land, are intersected by a number of roads and pleasant footpaths which lead either to the neighbouring mineral springs, or to two

ravines or glens almost unrivalled for their picturesque and even savage grandeur. These walks offer sites of great beauty to the admirer of fine landscape scenery.

Spa can scarcely be compared with any other watering-place, having features so peculiarly its own; for variety of scenery it yields to none; excursions may be varied *ad infinitum,* and every day the mind of the visitor is impressed with some new beauty: glens; romantic valleys; cascades among the mountain gorges; hills of every fantastic shape and form, now baring their rugged breasts to the rude south-wester, now draped with mantle of the richest green; forests of apparently primæval grandeur, and offering the most luxuriant foliage of every form and every hue, abound throughout the neighbouring Ardennes. If to these objects of interest be added the numerous and lovely walks cut out, with great care and taste, among the well-wooded and beetling hills which shelter the little town to the north and north-east; the majestic alleys and newly planted gardens of the *Promenade de Sept Heures,* and the beautiful pleasure grounds of the springs of the *Geronstère* and *Sauvenière,* the invalid will find as much of pleasant ground to walk or ride over, for health; as much to gratify

the eye, if he be a lover of fine scenery, as can be afforded by any watering-place in Europe.

Now all the natural beauties of the immediate neighbourhood of SPA are accessible to any good pedestrian, but for the invalid, unless he be content with the varied and cheerful walks near the town, it will be necessary to engage a private carriage or a pony, either of which may be had on much more reasonable terms than at the generality of watering-places on the continent. These ponies, the most agreeable for the invalid it is possible to conceive, being thoroughly well broken in for the saddle, cantering pleasantly, sure-footed and indefatigable, are of Andalusian origin, having been first introduced by the Spaniards during their occupation of the Low Countries; they are bred in the Ardennes and are admirably adapted to the rough ground over which the equestrian will often have occasion to ride, and even on the moors they may be safely trusted, as they will thread their way among the bogs with an instinct not inferior to that of the ponies of the Shetland isles. There are about 300 of them for hire in the season.

The climate of SPA is proverbial for its salubrity. situated at rather more than 1,000 feet above the level of the sea, the town itself possesses the advantage of

a rarefied and most invigorating atmosphere, while the neighbouring hills afford it sufficient shelter to render it a residence fit, at least in summer, for every class of invalids but those who are in an advanced stage of pulmonary consumption. Epidemics are unknown in this locality, and the low typhus and intermittent fevers, which are so prevalent on the Rhine and its immediate vicinity, are very rarely to be met with here. In all mountain regions the climate is uncertain, but the average of fine weather is as favorable to SPA as to any other place of similar geographical position. The invalid cannot be too much cautioned, however, against exposure to the air on summer evenings immediately after sunset; for the space of at least an hour the atmosphere remains extremely chilly, but the temperature, after that period, begins gradually to rise, and the nights are generally, in the full season, warm and agreeable.

The altitude of a watering-place has much to do with the action of mineral waters upon the constitution. The air in very deep close valleys, independently of its great density, is often much vitiated, whereas the atmosphere of open regions situated at a considerable height is more attenuated and pure, at the same time that it is more bracing and invi-

gorating. This is a matter of the utmost consequence to the patient whenever the physician has to recommend a mineral spring of a given medicinal character. Thus many constitutions which would well support iron in places moderately elevated above the level of the sea would severely suffer from the administration of this remedy, even in the mitigated form of mineral water containing but a minute quantity of the metal, in a place situated at a distance of some hundred feet above that level. Localities therefore of considerable altitude, such as SPA, are best adapted to torpid constitutions, cases of nervous debility, passive hemorrhage, inordinate mucous discharges occurring in persons of extreme laxity of fibre, and to those diseases which are characterized by a vitiated state of the constituent elements of the circulating fluid.

It is said that the coldness of a region, independently of its latitude, is in direct ratio to its height, and that an altitude of 300 feet is equivalent to a degree of latitude nearer the poles. This fact must not be taken unreservedly, as the atmospheric temperature of a locality is subject to important modifications arising from its aspect and its more or less sheltered position. In this respect SPA possesses no small advantages; a wide range of modifications may be called

into effect at the will of the local physician, and be made available in delicate cases. The town of Spa, situated at the foot of a lofty chain of hills, is completely sheltered from the north and north-east, and although open to the south and south-west, receives even protection from the winds blowing from those quarters through the well wooded range of hills that skirt the moors. This is a very important circumstance, as the south-wester on the continent is harsh, bleak and violent, unless subdued by some interposing heights; walks and rides, more or less sheltered, abound in all directions throughout a radius of three miles and offer gradations of increasing altitude which vary from 50 to upwards of 700 feet. Thus on the level of the town there are the well sheltered walks of the *Promenade de Sept Heures* and of the *Allée de Marteau;* on a somewhat higher level, the graduated ranges of shady walks on the southern side of the beetling hills immediately above the town; at a distance, south, of about half a mile, two most beautiful and picturesque ravines embellished with great taste and judgment; the one, the *Promenade d'Orléans;* the other, the new *Promenade des Artistes,* completed in 1849, which stretch up a considerable distance in the direction of the moors; and, lastly, if a more invi-

gorating atmosphere be required, there is the crest of the hills themselves and the wide expanse of the heathcovered moorlands nearly 2,000 feet above the level of the sea.

Spa contains about 4,000 inhabitants who carry on a great trade in those prettily painted boxes and other articles of maple wood known universally as *Spa* ware, and in the bottled mineral waters; it is the chief place of the canton and the seat of a Tribunal of first Instance. It possesses two *Bath establishments* and several good *Educational Institutions,* such as a College for the classics, mathematics and general education; a Drawing Academy; a School for Music and Primary schools for children of both sexes.

The *Drawing Academy* was founded by the Belgian government and the municipal council of Spa in 1843, under the direction of M^r^ Delvaux, who still continues at the head of the establishment. Independently of the number of clever artists it has already produced, it has had the effect of materially improving the character of the Spa-box painting both in composition and colouring.

There are two *Charitable Institutions* in the place: the Bureau de Bienfaisance for the relief of the poor from funds voted annually by the municipal council,

and the Hospice St. Charles, a foundation for the aged and infirm.

Both these establishments receive an important yearly subsidy out of the profits of the Play-tables.

The *Parochial Church* has been much embellished by its present Dean; the interior is well worth visiting.

The English service is performed throughout the year by a resident Clergyman, nominated by the British government. The Clergyman at *Spa* derives his income partly from a subsidy of the Belgian government and partly from subscriptions among the Congregation. Divine service is held in the summer at the *Vauxhall* and in winter at the *Pouhon*, at 11 and 3 o'clock.

There are three very fine buildings in Spa, erected at different periods by the Gambling companies, the *Redoute, Vauxhall* and *Salle Levos*.

The Redoute, built in 1769, is a vast structure of very plain exterior, but very beautiful within, and contains a fine staircase; two handsome rooms for play, the one serving for the rouge et noire, the other for the roulette tables; a long and spacious gallery decorated with pedestals and busts; a ball-room of noble and exquisite proportions, worthy of a first rate

watering place, and a pretty theatre, for Vaudeville and light Opera, open during the season four nights in the week.

The Vauxhall is situated in the street of that name, and was built in 1770 after the plans of the architect Barthélemy Renoz. Its principal room is very spacious and richly decorated in the style Louis XIV. The Vauxhall is surrounded by a garden which affords agreeable walks and charming points of view.

The Salle Levos was opened in 1785; like the two preceeding buildings, its exterior gives no indication of the splendor which reigns within. The Grand Ball-room is of magnificent proportions and serves in the full season for the Race-balls. A garden also surrounds this establishment, more extensive than that of the Vauxhall and laid out with much taste and skill; it is sought in summer as a cool retreat and quiet refuge from the bustle of the more frequented promenades. *The Club* is established at the Restaurant on the Place Royale, and supported by the English and foreign gentlemen who remain here the whole year or merely pass a portion of the season. The Club-rooms are delightfully situated, airy, spacious and well provided with papers. Immediately in front stands a very elegant orchestra where the band plays

every day from half past one to three and from six to half past seven in the evening when the weather permits. In cold or rainy weather the band plays at the same hours in the gallery of the Redoute.

On fine summer evenings there is frequently choral and instrumental music on a platform in one of the pretty walks cut out among the neighbouring hills, and the company then assemble in the Place Royale below; the sound of the music, as heard from so considerable a height, produces on these occasions a most fairy-like effect.

Racing. — The Spa races take place in the month of August and are much frequented; they occupy two days and are run on the new Race-course. There are Steeple-chases in June and September, four or five hundred pounds being run for, on these occasions; the old Course generally serves for that purpose.

Hunting. — Those who arrive late in the season would do well to stay over St. Hubert's day, and hunt on that occasion with the subscription pack of Harriers; after a hard day's run with the hounds, some fifty or sixty keen sportsmen sit down to a most sumptuous Hunt-dinner at the Hôtel de Flandre; a more friendly or cheerful circle does not exist in the whole country.

Excursions. -- The *tour des Fontaines,* as it is here called, is a drive round the springs ; the route generally followed forms a circle of about six miles by hill and valley through cultivated fields, moor and woodland.

The neighbouring valleys of the Hoegne and Amblève, independently of their natural beauties, offer fair sport to the Fly-fisherman.

The *Promenade des Artistes* is in a beautiful ravine which descends between the Sauvenière and Geronstère in the direction of the town ; from beginning to end it offers a constant succession of cascades and of rustic bridges for pedestrians ; the brook is everywhere fordable for mounted parties.

The *Promenade forestière* is a beautiful bridleway cut out through the forest above the town which stretches out in the direction of Franchimont ; it is reached by the *Promenade de Diane,* a road which ascends from the end of the street in which the Hôtel de Ville is situated, and which, following the crest of the hills to the right of the *Allée de Marteau,* terminates in the village of that name ; about midway along this road, a handpost points to the *Promenade forestière,* which, winding about a mile through the above mentioned forest, descends at length into the high road,

half way between Spa and Franchimont. The common people generally name this bridleway the *Promenade de Chincul.*

Chateau d'Amblève, eight miles from Spa, inhabited in the 14th century by *Guillaume de la Marck,* called *the Wild Boar of the Ardennes.*

Chateau of Franchimont, four miles from Spa, on the road to Pepinster. — This magnificent ruin is well worth visiting; its historical records are most interesting.

Cascade of Coo, on the Amblève, with a fall of about 60 feet of water. The environs of this cascade are extremely beautiful and offer fine landscape scenery. This excursion, which no traveller who visits Spa should neglect to make, may be made to comprise a visit to Stavelot and Malmedy, a frontier town of Prussia, delightfully situated in the picturesque valley of the Warsche. The first view of Malmedy, arriving either from Stavelot or Spa, is extremely imposing.

Grotto of Remouchamps. This grotto is situated at about seven miles to the southwest, and is one of the greatest natural curiosities of this country. It is much visited in summer, and constitutes one of the loveliest excursions that can be made. A visit to *Montjardin* is generally included in this ride.

Falls of the Hoegne. This is a series of cascades for a distance of 600 yards in a gorge of the mountains through which this beautiful little trout stream passes as it descends from the moors, to the east of Spa, in its progress to join the Wahai at Franchimont.

Other agreeable walks, rides and drives may be made over the hills to Verviers, to Juslenville and to Chaudfontaine. The limits of this work preclude a more detailed account of these excursions; the reader should not leave Spa without fully enjoying the emotions they afford, and perhaps after all it is better to leave him the first freshness of his impressions than to anticipate them by a description, which, however carefully written, would be very inadequate to do them justice.

Artists.—Spa has the good fortune to possess several artists of great merit, and posterity no less than the present age will be compelled to do justice to the talents of such men as *Delvaux, Marcette* and *Crahay*.

Delvaux commenced the study of the fine arts in the studio of Van Assche in the year 1827, and carried off the first prize for landscape painting in the great national exhibition of 1829; the picture was purchased by government for the Royal Museum of Brussels.

In the years 1833, 1836 and 1842, Delvaux again obtained the first prizes, and afterwards became the successful competitor in landscape painting at the exhibition of the Louvre and in several of the principal towns of France. He is remarkable for the warm tone of his colouring and the masterly vigor of his style.

Marcette commenced his studies under Delvaux, and afterwards studied several years with the celebrated Koekoek. His landscapes are remarkable for their exquisite colouring and for the beautifully limpid and vapory tone of his back-grounds.

Crahay, also a pupil of Delvaux, is rising rapidly to eminence; he particularly excels in sylvan scenery; his touch in pieces of this description is not unworthy of his talented master.

There is likewise a very clever NATURALIST here, Mr. Wolff; from whom can be obtained portable collections of the plants and minerals of the neighbourhood.

To conclude this chapter it is but right to observe that very many and notable improvements have taken place since the publication of the first edition of these notes, while more important ones still are in progress: gas lighting and a branch rail-

way from Pepinster are among the latter. In a word, a new era is opening and every thing bids fair to realize the long entertained hope that this ancient and most interesting watering-place may rival in splendor, nay even surpass the SPA of the *last century,* the most brilliant period of its existence.

II

On mineral springs in general.

Most of the nations of antiquity, particularly the Greeks and Romans, entertained the highest opinion of the efficacy of mineral waters in the cure of disease; placed under the protection of some tutelary divinity, each noted spring was frequented, as in our days, by crowds of sufferers, while many of them were enclosed, not, as at present, within the walls of edifices devoted too often to frivolous amusements or more culpable dissipation, but within the hallowed precincts of temples raised in gratitude to the munificent Gods. Even at a much later period, when the rites of christianity had replaced those of paganism, we find the mineral springs placed under the especial

tutelage of some favorite saint. The religious feeling thus connected with them at such different periods of the world's history, affords a satisfactory proof that their salubrious qualities were as well known and as much appreciated then , as in modern times.

They only who have experienced relief from a course of mineral waters, who have arrived at the chosen spring broken down, alas how many! in mind and body, having vainly exhausted all the means which human art could suggest to alleviate their sufferings, and have returned to the bosom of their families with the glow of health upon their cheeks, with bounding step, and hearts filled with gratitude to the Giver of all good, can adequately comprehend the anxious hopes which animate the thousands of their fellow-beings who yearly flock to these great sources of health. The following verses, from one of the most exquisite odes of the classic Wellesley, which breathe in the purest strains of the poet the warmest gratitude to the Almighty, are here singularly applicable.

O Fons Salutis! Vita! Fides mea!
Tumultuosi qui mala pectoris
Compescis, et morbi furores
Attenuas, saliente lymphâ :
. . . . . .

Sparsim remotas condis origines
Arcana rerum subter, et abditus
Nascentis ad terræ recessus
Primigenique elementa mundi.
. . . . . .
Agnosce Patris munera! Quem Deum
Agnoscit, omni parte operis sui
Ad solis occasus et ortus
Terra, mare, æthereumque cœlum.

Fountain of health! and hope! and faith! and life!
That quell'st my tortured bosom's restless strife;
And to relieve my agonizing dreams,
Pour'st forth thy crystal, cool, bright, salient streams;
. . . . . .
In nature's secrets hid thy birthplace lies,
Far scattered, deep, remote from human eyes,
Amid the germs that first gave nature birth
And the primæval elements of earth.
. . . . . .
Acknowledge God's good gifts; whose bounteous hand
His works acknowledge all through main and land,
Where'er the sun sinks low or rises high,
The earth, the sea, and the ethereal sky.

The attention of the profession has been remarkably awakened of late years to the consideration of mineral waters; chymists of the highest rank have devoted much time and great labour to their analysis; and substances have been discovered in them which a very few years since were not suspected; much that was before obscure in the theory of their action on the

economy, is in consequence now elucidated; many able treatises have been written on the subject by distinguished physicians of almost every country in Europe, yet it is a matter of general remark and of well merited reprobation that many medical men are still lamentably ignorant of this most interesting and most valuable branch of therapeutical knowledge.

Thus if some cases of disease which have resisted all ordinary methods of treatment have been cured or much relieved by a course of mineral waters, suggested to the patients by their own non-professional friends; while, on the other hand, as every medical man who practices at a watering-place can amply testify, patients are sent by members of the profession to springs the least appropriable to the cure of their diseases, even if the latter are capable of being remedied by mineral waters at all, it is not the less regrettable that the recommendations of lay acquaintances lead but too frequently to disappointment. Analogous morbid affections cannot always be treated by the same means, and mineral waters are powerful agents, whatever may be said to the contrary, for effecting good or evil.

A great and most prevalent fault of physicians generally, nay of those who are the best acquainted

with the subject of mineral waters, is, that even when they recommend their patient to a physician practising at the spa they have selected, they rarely furnish the latter with the history of the case; however abridged this may be, it marvellously aids the local physician in carrying out the cure. The necessity of it is so evident that the mere suggestion should suffice to lead the invalid to appreciate to its fullest extent the justice of the observation and to demand a professional statement before setting out on his journey.

The peculiar character of mineral water viewed as a medicinal agent is that notwithstanding its being composed of a multitude of elements held together in solution in obedience to the laws of chemical affinity, there is nevertheless a unity in the whole which affects the economy in a manner totally inexplicable by any consideration of the constituent elements themselves.

This peculiarity is less due to the quantity or the quality of soluble substances contained therein than to the reciprocal elective affinities of these.

For example, there is a vast difference in the qualities of a mineral water drunk on its first emerging from a spring and when taken at a distance from its source, should in the mean time any decomposition

have taken place. The water, in the first instance, constitutes a unity possessing positive specific properties, while, in the second, the ingredients which compose it fall back, each at first into the sphere of its own individual existence, and subsequently the whole into entirely new forms of chemical combination.

In the present state of science, we are in possession of no means by which we can discover or estimate all the component parts of mineral waters or their various affinities with each other, and more particularly when organic matter is held in solution; any attempt at analysis must necessarily loosen the original combinations, and the separation of the component parts must consequently educe new products of a totally different intrinsic character.

Thus artificial mineral waters, however ingeniously prepared, resemble the natural waters from which they are imitated, only in their *general*, but by no means in their *specific* character.

III

On chalybeate waters.

By far the greater number of mineral waters contain iron, however minute the quantity may be, but those waters alone are said to be chalybeate in which one or other of the salts of iron constitutes a really important ingredient among the matters held by them in solution.

Chalybeate waters are generally very limpid, very cold, astringent to the palate, and, when they happen to contain the vitriolic salt of iron, have an inky flavor; this is particularly the case with the Sandrock spring in the isle of Wight, the Alexis-brunnen in Anhalt-Bernberg, the Stecknitz in Bohemia, and the Vlotho in Westphalia. Such waters are to be ap-

proached with extreme caution, for if plethoric persons, or those subject to determination of blood to the head, should unadvisedly employ them, the consequences might, and would in all probability, be fatal. Their taste, however, is so repulsive that it is hard to be conceived that any except patients who are most strenuously recommended by the faculty in rare and particular instances to take them would allow them to do more than wet their lips; waters of this description usually contain alum. The iron contained in other ferruginous or chalybeate waters is mostly held in solution by its combination with carbonic acid gas. These waters are far more palatable and impart a sharp pungent sensation to the nostrils similar to that produced by soda-water or bottled beer, at least when the quantity of this acid gas is in great excess. Some few waters of the latter description really contain sulphuretted hydrogen; others give rise, upon passing over the palate, to the idea that they also contain sulphur; upon smelling them, however, not the smallest odour of sulphur is to be perceived; it has been found that such springs, the Geronstère for instance at Spa, contain a small trace of free hydrogen gas, to which the above error is to be attributed. This circumstance deserves parti-

cular attention as almost every one drinking the Geronstère is inclined to believe, and even to maintain, that the spring contains sulphur, whereas not the smallest trace of this element has ever been discovered in it up to the present time. The principal chemical ingredients found in chalybeate waters are the sulphuric, the muriatic and the carbonic salts; manganese, strontian, lithion and the phosphoric salts are occasionally to be detected, but they exist only in very minute quantities.

With respect to the gases found in these waters, independently of the carbonic acid; hydrogen, sulphuretted and carburetted hydrogen and even *azote* or *nitrogen* gas is sometimes to be discovered; this is particularly the case in England, where nitrogen has been discovered in most mineral waters. It was long a matter of doubt whether the detection of the latter gas, so rarely to be found in the mineral waters of the continent, might not be due to some more delicate tests being employed by English chymists, and the presumption appears not to have been ill founded, for more recent analyses have proved its presence in certain continental waters, as those of Aix-la-Chapelle, in no inconsiderable quantities (18 cub. inches to the pint in the Kaiserquelle), and even in chaly-

beate waters this gas has likewise been recently discovered, as, for instance, at Hofgeismar in Kurhessen and at Muskau in Silesia.

The peculiar action of chalybeate waters on the economy depends not only on the iron they contain, but on the various solid and gaseous matters held likewise in solution.

The continental chalybeate springs are in general far more agreeable and efficacious than those of England; this is due to the much greater quantity of carbonic acid gas they contain, which not only enables them to hold considerably more iron in solution, but permits them at the same time to sit more lightly on the stomach and to be more easy of digestion.

"Most of the chalybeates of England," says Doctor Granville (speaking of Tunbridge wells), "are cold, heavy, flat, indigestible waters, and lack that which makes medicinal steel water admissible, cheering, easily digested and exhilarating; they lack, in fine, plenty of carbonic acid; they lack effervescence."

All the admirable qualities cited by Dr. Granville are possessed by the SPA waters in a most eminent degree, and their reputation has not to this hour been eclipsed by that of the most favored chalybeate spring in Europe.

Chalybeate waters may be divided into six distinct classes, namely :

1. TERRO-SALINE CHALYBEATES : these waters, besides carbonate of iron, contain no inconsiderable quantities of Glauber's salts ; they contain also, but in comparatively minute quantities, the sulphuric, chlorhydric and carbonic alcaline and earthy salts. Example : *Pyrmont, Driburg, Brückenau, Schwelm* and *Schandau.*

2. ALCALO-SALINE CHALYBEATES : they differ from the first by their containing much carbonate of soda. Example : *Franzenbad, Marienbad, Roisdorf* and *Birresborn.*

3. TERRO-ALCALINE CHALYBEATES : they contain carbonate of soda, lime and magnesia. Example : *Spa, Schwalbach, Malmedy, Tönnestein, Harrowgate* and *Tunbridge wells.*

4. TERREOUS-CHALYBEATES : these are distinguished by the quantities of the carbonic and sulphuric earthy salts they contain, and by the absence of carbonate of soda. Example : *Freudenthal, Potsdam, Holtzhausen* and *Lichtenthal.*

5. VITRIOLIC CHALYBEATES : these waters contain the sulphate and sometimes the chlorhydrate of iron, also sulphuric and chlorhydric salts ; possess scarcely

any carbonic acid gas and no carbonate of soda. Example : *Alexisbad, Stecknitz* and *Vlotho*.

6. ALUMINATED CHALYBEATES : they contain often but very minute doses of the sulphate of iron, but sometimes considerable quantities of alum. Example : *Buchowina, Stecknitz, Sandrocks. Llandridod wells, Hartfell* and *Vicarbridge*.

IV

On the blood and on iron as one of its chief constituents.

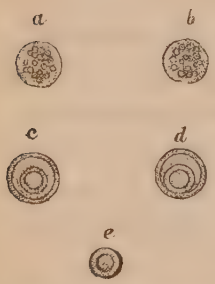
The blood is a fluid constantly circulating throughout the body, during life, in numberless canals. From this fluid all the tissues and organs derive nutriment, the decaying particles of the frame requiring new ones to replace them. Every portion of the body subtracts and appropriates to itself, as the blood passes by, the particular materials of its own substance; materials which either pre-exist in it or are capable of being formed therefrom by chemical process. The blood stream in its course receives two tributaries: the lymph which holds in solution the worn-out particles of the tissues and organs, and the chyle which conveys fresh nutriment derived from digested aliments.

Treviranus remarks "each single part of the body, in respect of its nutrition, stands to the whole body in the relation of an excreted substance," an aphorism which is thus lucidly interpreted by Dr. Carpenter: "Each part of the body, by taking from the blood the peculiar substances which it needs for its own nutrition, does thereby act as an excretory organ, inasmuch as it removes from the blood that which, if retained in it, would be injurious to the body generally. Thus, the phosphates, for example, which are deposited in our bones, are as effectually excreted from the blood, and as completely prevented from acting injuriously on other tissues, as those which are discharged from the urine."

When examined under the microscope, it no longer appears as a homogeneous fluid, but as consisting of two distinct components: the one a transparent colourless liquid called *liquor sanguinis;* the other a

Red corpuscles from human blood: — *a.* Viewed on the surface. *c.* Viewed in profile. *b.* An aggregation of the corpuscles in a roll. Magnified 400 diameters.

set of corpuscles or globules, of the form of a double-convex lens, either grouped together like piles of coins or floating in it singly. These corpuscles present a distinctly red hue, the intensity of which depends upon the degree in which the piles are approximated. Scattered among these corpuscles, are to be seen, here and there, and generally along the sides of the canal, when the blood is viewed in circulation as, for example, in the web of a frog's foot or wing of a bat, other corpuscles quite colourless and differing from the first in form by their being perfectly spherical.



Phases of the human blood-corpuscle (after Wharton Jones): *a*. and *b*. Granule cells in the coarsely and finely granular state. *c* and *d*. Nucleated cells, *c*. without colour, *d*. with colour. *e*. Free cell-form nucleus or perfect red corpuscle.

The colourless corpuscles in appearance resemble those of the lymph and chyle and are in proportion to the red ones as 1 to 50; whether they are distinct and independent particles of the blood, having their own especial functions to perform, or are the early and embryo condition of the red globule, is a point

upon which physiologists are not agreed; it is however admitted that the earliest blood corpuscles of the vertebrata are colourless, and that these colourless corpuscles bear a large proportion to the red even at an advanced stage of embryo existence; in the blood of invertebrata are no other than colourless particles.

The most generally received opinion at the present moment is that the colourless corpuscle is an intermediate stage between the lymph and chyle corpuscle and the red. In certain diseases in which there is great and sudden prostration, as in hemorrhage, wherein the red globules are exceedingly diminished, a new production and speedy increase may be promoted by a generous diet and the use of chalybeates: a fact which greatly tends to support this doctrine.

Restoratives are imperatively called for whenever a great amount of blood has disappeared from the circulation, but the deficiency cannot be repaired by the food alone; for though, as Suttro judiciously remarks, "you may favour a more energetic sanguification by a liberal diet, it must always be remembered that the very weakness of the blood causes a corresponding debility of the digestive organs, so that the more repairing particles the blood claims from the gastric pur-

veyor the less can be elaborated by that power; hence the necessity of exhibiting chalybeates to strengthen the digestive system, and the advantage of such, as being naturally dissolved in a large quantity of carbonic acid, supply the want of a certain material of the blood in the most ready form for immediate assimilation."

The red and the colourless corpuscles have like other cells a definite term of life; whilst some are undergoing disintegration, others are in a state of advancing developement to supply their places.

Both the transparent fluid in which the corpuscles float (*liquor sanguinis*) and the corpuscles themselves are rich in organic and inorganic materials destined to meet the wear and tear of structure. As in health these materials maintain among each other certain definite proportions, so in disease is there invariably some disturbance of that equilibrium and not unfrequently a complete degenerescence of one or several of the blood's constituents.

An integral and most important part of the blood globule is iron, which exists in it in a state of organic union in the proportion according to Mulder's analysis, of 7 per cent. Iron is likewise found in the secretions and excretions of the human body, but here it

is in a state of chemical combination, particularly under the form of chlorhydrate or of phosphate of the metallic oxyde.

The following is Lehman's analysis of the blood.

1000 parts of *red corpuscles* contain :

Water	688.00
Solid residue	312.00
Hæmatine (including iron)	16.75
Globuline and cell membrane	288.22
Fat	2.31
Extractive matters	2.60
Mineral substances (exclusive of iron)	8.12
Chlorine	1.686
Sulphuric acid	0.066
Phosphoric acid	1.134
Potassium	3.328
Sodium	1.052
Oxygen	0.067
Phosphate of lime	0.114
Phosphate of magnesia	0.073

1000 parts of *liquor sanguinis* contain :

Water	902.90
Solid residue	97.10
Fibrin	4.05
Albumen	78.84
Fat	1.72

Extractive matters.	3.94
Mineral substances.	8.55
Chlorine.	3.644
Sulphuric acid.	0.115
Phosphoric acid.	0.191
Potassium.	0.325
Sodium.	3.341
Oxygen.	0.403
Phosphate of lime.	0.311
Phosphate of magnesia.	0.222

Professor Nassé reckons the average quantity of blood in the human adult at 20 pounds, and considers that the blood of 10,000 men would furnish 111 pounds of iron.

In certain diseases, particularly chlorosis, the red-globules of blood are in quantity below the average standard; now, as the quantity of iron in the circulating fluid must necessarily be diminished in the same proportion, it follows that the composition and properties of the blood in those diseases are capable of being very considerably modified by the exhibition of ferruginous preparations or the natural chalybeate waters. No class of patients derive greater benefit from the chalybeate springs than those in whose blood there is this paucity of red globules.

The opposite state to the one just mentioned is

plethora; here, instead of a defective formation or profuse expenditure of blood, there is either too much blood made, or too little expended. The obvious sign of abundance of the red globules is the florid colour of the lips, cheeks, gums, and even hands. This state principally occurs in persons of a sanguine temperament and possessing much nervous energy. Such persons should not venture upon the chalybeate mineral waters.

Between these two extremes there is a wide range in the condition of the blood, considered both with respect to the quantity and to the quality of this fluid; and, as one of its most powerful modifying agents is iron, the chalybeate springs are called into requisition by the faculty as one of the most precious adjuvants of medicine.

The blood globules are most deficient in young persons of the female sex inhabiting towns and cities. This condition is principally occasioned by sedentary habits, bad diet, the want of free circulation of pure air and of the due ingress of solar light; it is the fatal consequence of an artificial state of existence and of the defective system almost universally employed, until within the last few years, in the construction of streets and houses in populous cities. It is not alone

the poor sempstress on whom these causes act; young ladies of the middle and even higher orders do not always escape. Confectionary and made dishes; rooms darkened by massive draperies; too much carriage exercise and too little exercise on foot; close, heated, ill-ventilated theatres and ball-rooms are agents in the production of a vitiated state of the blood, of a diminution of the due proportion of red globules, hardly less pernicious than those which operate upon females of the lower classes of society. Contrast these pitiable chlorotic beings, of whatever class, exposed to such deleterious influences, with their pallid, yellowish and sometimes even greenish hue; their general muscular weakness, faintness and fatigue upon the smallest physical exertion; their feeble, unequal and silky pulse; the coldness of the surface and extremities, and their organic prostration evinced by the pale clammy tongue, torpid bowels, and disordered secretions, with the ruddy peasant girl or with those light active cheerful rosy females who are placed in more fortunate circumstances, and whose health is cared for by the wisdom and enlightened affection of those who take charge of their developement! There is the same difference between these two orders of beings as between the sickly

pallid plant that has been kept too long in a cellar or dark room, and the fine vigorous healthy flower which expands in consummate beauty in the well kept garden. As plants under the influence of air, sunshine and showers, possess the admirable property of organizing nature's elements to furnish the animal creation with a sufficiency of nutritive materials for all the purposes of life, so, under parallel vivifying influences, are these same nutritive materials converted into the most characteristic organic element of animal life itself, namely, the healthy globule of blood.

These considerations lead to the remark that there are many patients living in large cities in whose cases preparations of iron are indicated and who continue to employ them, even for a great length of time, without any real advantage, nay, not unfrequently with the very opposite results; such patients would recover rapidly by a course of the chalybeate waters of Spa. This fact is of easy explanation. Iron, *poured into the system,* to use the common expression, will no more revivify the circulating fluid, if outward deleterious influences are at work upon the economy, than will the watering of a plant increase its vigor if placed in an improper soil or exposed to a vitiated or inclement atmosphere.

Under the most favourable circumstances the blood can only assimilate that quantity of the metal which is necessary to the formation of the red globule, all else being superfluous and passing off with the alvine excretions. Now, when this sanative process fails, the system cannot, in consequence, become invigorated, but on the contrary the digestion from being weak is still more weakened, and then not unfrequently succeed constipations, headaches, palpitations of the heart, — increased if they before existed, — and a still greater prostration of muscular strength. Whereas, under the influence of change of climate, scene and habits, as likewise of horse exercise and agreeable walks in the bracing and invigorating atmosphere of this agreeable watering-place, a corresponding change is operating in the whole system, while the absorption of the particles of iron is singularly favoured by their solution in a most digestible and salubrious fluid, the sparkling and exhilarating water of the chalybeate spring itself.

The springs of Spa.

THE POUHON. The most celebrated and most frequented by invalids of all the springs of SPA, is undoubtedly the Pouhon. The period of the discovery of this spring still remains a matter of conjecture, but certain it is that as far back as the latter end of the 11th century the efficacy of its waters began first to be generally known, for in the 12th century crowds collected about the well, and in the summer season large tents were erected for the accommodation of the visitors. In consequence of the reputation thus acquired by the Pouhon, the place itself began to assume some importance, and in the 14th century new SPA was founded by a certain Colin le Loup, the SPA

of our days as distinguished from old SPA, which still continues a mere village although quite adjacent. Colin le Loup, or Wolff, was a native of Breda who for the cure of some disease came to pass a season here in 1327. Having derived great benefit from the waters and feeling how much more advantageous it would be to visitors were the accommodations of a better order, he purchased of the prince bishop of Liége a considerable plot of ground surrounding the spring, and built close to it a large and commodious house for their reception; the speculation succeeding, others followed his example, purchasing small parcels of land of Colin and building thereupon similar establishments, so that before the end of the century Spa contained 250 houses. In the 16th century, we find among the visitors several of the most distinguished men of letters, ecclesiastics and physicians of the age, with a few high personages, such as the Dukes of Parma and Nevers. In the 17th century, princes began to be attracted to the spot, and there are documents which prove that our own *merry monarch*, Charles II, passed at Spa the season of 1654. But the most brilliant period of the history of SPA was reserved for the 18th century; the fame of the Pouhon attracted sovereigns as it still attracts the aristocracy:

at one time, not less than thirty sovereigns and princes of royal blood were assembled here together, and in ordinary years there were seldom less in SPA than fourteen practising physicians.

One of the most illustrious guests who derived benefit from the Pouhon was Peter the Great. This august personage passed at SPA the season of 1717; to perpetuate the memory of his restoration to health by the use of its waters, and at the same time as a testimony of his gratitude, he presented, upon his return to Russia, the handsome tablet still seen under the portico which contains the following inscription commemorative of the event.

Petrus Primus, D. G. Russorum
Imperator,
Pius, felix, invictus,
Apud suos militaris disciplinæ restitutor,
Scientiarium omnium artiumque protosator,
Validissimâ bellicarum navium
Proprio marte constructâ classe,
Auctis ultra finem exercitibus suis,
Ditionibus tàm avitis quàm bello partis,
Inter ipsas Bellonæ flammas in toto positis,
Ad exteros se convertit,
Variarumque per Europam gentium lustratis
Moribus,

Per Galliam ac Namurcum atque Leodium
Has ad Spadanas aquas,
Tamquam ad salutis portum, pervenit,
Saluberrimisque præsertim Geronsterici
Fontis feliciter potis
Pristino robori optatæque incolumitati
Restitutus fuit.
Anno MDCCXVII die XXIII julii.
Revisisque dein Batavis,
Avitumque ad imperium reversus,
Æternum hocce gratitudinis suæ
Monumentum
Hic apponi præcepit.
Anno MDCCXVIII.

The present monument of the Pouhon, the portico of which is of the Tuscan order, or rather meant to represent it, was built by command, and at the expense, of their Royal Highnesses the Prince and Princess of Orange in the year 1820. At the northern extremity of this portico, a few steps lead down to the well, at which a person is placed to present its sparkling waters to the invalid. The temperature of this spring is 50° Fahrenheit, or 8° Réaumur; the flavor of the water somewhat acidulated, piquant and agreeable; if a glassful of it be allowed to remain for a few seconds, the sides of the vessel become co-

vered with myriads of little pearly bubbles of carbonic acid gas, many of which mount rapidly and explode at the surface of the liquid. The quantity of carbonic acid gas contained in 16 ounces of the Pouhon water is, according to the analysis of Monheim, 21.68 cubic inches. The Pouhon is situated at about 1,000 feet above the level of the sea. Its waters are exported in glazed earthen jars to all parts of the world.

THE SAUVENIÈRE AND GROESBECK. These two springs, situated at about a mile and a quarter from SPA, and 470 feet above the level of the Pouhon, are separated by a distance of only a few paces. Their medicinal qualities differ, the Groesbeck containing about a quarter of a grain less to the pint of the carbonate of iron, and about an inch more of carbonic acid gas, and possessing more marked diuretic properties. The Sauvenière, on the other hand, appears to possess a specific action in allaying the irritability of the womb in certain chronic forms of inflammation of that organ.

The date of the discovery of the Sauvenière and the Groesbeck is unknown, but certain Antiquaries pretend that it is one of these springs to which Pliny alluded in the following passage : " Tungri, civitas Galliæ, fontem habet insignem, plurimis bullis stil-

lantem, ferruginei saporis : quod ipsum nonnisi in fine potûs intelligitur. Purgat hic corpora, tertianas febres discutit, calculorumque vitia. Eadem aqua igne admoto turbida fit : ad postremum rubescit. "

« Tongres, a city of Gaul, possesses a remarkable spring. Bubbles of air escape from it; its flavor is ferruginous; this however is only perceptible after passing the palate. It is purgative and dispels intermittent fevers and calculous affections. It becomes turbid by exposure to heat and at length assumes a red appearance. »

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The reason for assuming this to be the spring alluded to by Pliny was simply its proximity to the old Roman road, which passed close by [1], and the fact that the Romans not only understood by *civitas* a city, but also an entire district and even province. It is certainly a far fetched idea, inasmuch as there is a chalybeate spring in the very town of Tongres, the ancient capital of the Tungri.

Formerly, particularly in the 17th century, the Sauvenière was so much in vogue that the water furnished by the source hardly sufficed for the supply of

[1] A vestige of this road, in length about a furlong, is still found between the Sauvenière and the pretty cottage and grounds called Sous-le-bois

the invalids who assembled there in such numbers that regulations were obliged to be established in order that each might be satisfied in his turn.

These springs are situated on the road from Spa to Malmedy and Stavelot, in the midst of a wood which skirts the moors; their position is picturesque and the grounds attached to them are laid out with much skill and taste. A noble alley of elms and lindens terminates abruptly upon the verge of a ravine from which the view in summer is delightful; the ravine itself, to which allusion was made in the first chapter, has been much embellished by art, and for the distance of half a mile affords a most lovely and well shaded walk, enlivened by numerous cascades rushing over rocks and huge boulders, and on the fine evenings of the earlier part of the season by the sweet notes of the nightingale.

At the entrance to this ravine may be seen, enclosed within an iron railing, the

MONUMENT D'ORLÉANS,

a truncated column of black marble with the following inscription :

A LA RECONNAISSANCE.

« Au mois d'août 1787, les eaux de la Sauvenière ayant rétabli la « santé de Madame la Duchesse d'Orléans, ses enfants ont voulu consa- « crer le souvenir d'un événement si cher à leurs cœurs, en érigeant « ce monument au bout du bois dont ils avaient eux-mêmes tracé et « fait les allées, pour la promenade de leur mère chérie.

« Ce monument, détruit le 6 décembre 1792, a été rétabli par ordre « de S. M. Louis-Philippe Ier, roi des Français, le 1er juillet 1841. »

Whatever may have been the period of discovery of the Groesbeck, the great reputation it enjoys dates only from the year 1651, when a certain Baron of Groesbeck, from whom it takes its name, was cured by it of a most painful renal affection; an elegant niche with a marble entablature and an inscription in the Latin tongue commemorates the circumstance.

Attached to these springs is a very comfortable and well conducted establishment where refreshments are to be had at very moderate prices. Many of the Spa guests delight in breakfasting here, *al fresco*.

THE GERONSTÈRE. The Geronstère enjoyed formerly an immense celebrity, and for a long period was the most fashionable of all the springs of Spa; it was the favorite rendez-vous of the *haut ton* and the constant scene of their gayest festivities. The beauty of its situation, at a considerable height in the midst of an

extensive forest and commanding the most magnificent landscape; the extensive gardens laid out with consummate taste and diversified with lawns, shrubberies, parterres of flowers and a noble and majestic alley of fine forest trees; the great intrinsic value of the waters of the source itself and the commodious edifice erected for in-door pleasures and recreations, all conspired to render it worthy of the favour of its numerous and distinguished guests. Although much shorn of its former attractions and parsimoniously kept up by the town authorities, it still continues to be a favorite resort, not only of invalids, but of those who meet at Spa for the gaieties of the season; picnics constantly enliven its pleasant lawns, and every year in the full season a fête is given at the joint expense of the Redoute and the Town of Spa. On this gay occasion crowds of fashionables assemble to witness a variety of popular sports; dinners are served under the wide spreading branches of the fine old forest trees; as the day closes, the gardens are brilliantly illuminated, a very effective display of fire-works takes place, and a charming bal champêtre is spiritedly kept up until the waning lamps betoken the approach of morn.

The well is sunk in the solid rock and is sur-

mounted by a construction in the form of a cupola of hewn stone, the cornices and dome being supported by four columns of red marble.

The water of this source is the least agreeable to the palate of all the springs of Spa, from the free hydrogen present in it, which, as I have before observed, gives rise to the impression that it contains a trace of sulphur. It is, however, extremely potable, and a day or two suffice to render the invalid quite reconciled to this peculiarity. The Geronstère is the most distant of all the Spa wells, being somewhat less than two miles from the town. Its altitude is 470 feet above the level of the Pouhon.

THE TONNELETS. These springs are but a mile distant from the town of Spa, and their celebrity dates only as far back as the year 1757 when their waters were analyzed by an English physician, Dr. Lucas, whose high praises of their quality and efficacy brought them into immediate favor.

Here as at the Sauvenière there are contiguous sources; the first two are enclosed by a small square building like a porter's lodge; which serves to domicile during the day the person who attends the visitors. The third is an open well in the green-sward close by.

The fashionable vogue of the Tonnelets had but an

ephemeral existence, not owing to any unfounded merits attributed to the springs themselves by their first patron, but to the impossibility, it was thought, of erecting on the immediate spot an appropriate edifice for the shelter and amusement of the SPA guests, from the unsteadiness of the soil, which consists of loose bog earth. Their short lived reputation was however very brilliant, for invalids flocked to them in such crowds that the other springs, during several years, were well nigh deserted; from the information derived from the inhabitants of SPA there is more reason to believe that the outbreak of the first French revolution was the main cause of their decadence, as SPA, from that period to the end of the war, shared the same fate as all the other watering places of the continent. A large bath establishment was built, at about 30 or 40 paces off, well supplied with mineral water from the springs which fed likewise a spacious cold plunging bath situated in the intermediate garden. These baths no longer exist, and the vast area of the plunging bath is half filled up with mud, but on the site of the former a Polish gentleman, Count Rottermund, has lately constructed a handsome villa.

The waters of the Tonnelet at each of the sources contain a great abundance of carbonic acid gas; the

old springs resemble in flavor the Pouhon, while the new one approaches nearest in taste to the Geronstère.

About ten minutes' walk from the Tonnelet, in the village of Niveset, is a cellar in one of the cottages, which at certain seasons is filled with carbonic acid gas; this gas issues freely at various spots in the peat district of the immediate vicinity.

THE BARISART. This is the last spring to be mentioned and is about the same distance from Spa as the Tonnelet. It lies in a pleasant valley, by the side of a new road opened from Vieux Spa to the Geronstère; the well is surrounded by a clump of young fir-trees which may be descried immediately after passing a farm called Hochtasar, the only house on the road side after leaving the village. It has not been yet analyzed, but the spring, like all the others at Spa, is a chalybeate one containing abundance of carbonic acid gas; its flavor is most agreeable, slightly acidulated, and its appearance in the glass more sparkling than that of the Pouhon. This water is most refreshing and exhilarating, and well deserves for its powerful medicinal qualities the great vogue which it has recently acquired.

So lately as in 1848 the Barisart was a roadside well reputed among the peasantry as possessing ver-

mifuge properties: its waters, being clear and sparkling and of by no means an unpleasant flavor, tempted the author of this volume, on his first arrival at Spa, to indulge in a beaker or two, *en passant,* in his daily walk to the Geronstère; a favorite one on account of the wildness of the valley and the extensive and lovely views from various points of this neglected route. He had long laboured under chronic dyspepsia accompanied by amblyopia, and great was his satisfaction as well as surprise when in about ten days a very sensible diminution occurred of the most painful symptoms of the disorder. Encouraged by such evident signs of returning health, the spring was visited now twice a day and the potations gradually increased; at length every symptom pathognomic of the disease disappeared: *five weeks' assiduous attendance at the spring had effected a lasting cure!* As may be supposed, the author's personal experience was not forgotten when cases similar to his own occurred in practice; and as these are very numerous, not only among invalids who come to Spa for the recovery of health, but among those who visit it for mere change of scene, the results of a prescribed course of the Barisart waters were in most instances highly satisfactory, and the reputation of the spring soon rested on a solid foundation.

The authorities of the place now directed their attention to this delicious source, improved the road to it, which still leaves much to desire, and embellished the spot by forming an ornamental plantation around it and a huge grotto, over the well itself, of erratic blocks, found in the immediate neighbourhood. The well is enclosed in a cast iron cylinder to prevent the ingress of soft springs, and the grotto surmounted by a *pavillon*. A *chalet* is very shortly to be constructed, close by, for the proper accommodation of visitors, and, when completed, the Barisart will present an unique and most attractive appearance; it will be, in short, one of the prettiest objects in the environs of SPA.

VI

Analysis.

If it be admitted that those waters which contain in a given volume the greatest amount of medicinal substances may claim the highest rank among mineral waters, it is no less a matter of common notoriety that there are mineral waters remarkably deficient in the aggregate quantity of these, which nevertheless possess a most powerful action on the economy. The activity of a mineral water depends principally on its solvent powers and on the nature and more or less perfect affinities of the soluble substances themselves. A mineral water should be therefore drunk immediately at the source if its solvent powers depend upon, or are augmented by, the presence of carbonic acid or

other gases. In chalybeate waters which, like those of Spa, contain the carbonate of iron, this metallic salt is always present in *minute* quantities; among the springs of Germany the richest in this metal are those of Schandau, in Saxony, which contain the extraordinary quantity of 4.38 grains of the carbonate of iron to the pint. The richest in England of the same character are those of Shotley-Bridge, which contain 0.92 of a grain, while those of Tunbridge contain only 0.28 of a grain. The usual quantity ranges from half a grain to a grain and a half per pint. The other principles, such as the terro-saline and alcalo-saline particles, contained in these waters, are most erroneously supposed to hold a *subordinate rank;* in reality they exercise an immense influence over the economy in aiding the action of the iron according to their particular or aggregate quantities, and their loose or tenacious affinities with each other and with the ferruginous salt itself.

The identity of the inorganic compounds contained in the blood with those contained in mineral waters is striking, and although all may not be present in the *same spring,* yet there are very few *important ones* which do not contain the majority of these substances. The blood, therefore, is not modified, after the inges-

tion of mineral waters by any single one of their inorganic compounds, but by the aggregate amount. Physiologists are pretty generally agreed upon the uses of these integral constituents of the circulating fluid; some of them, it is considered, administer to the peculiar functions and conditions of the blood itself; others form part of the torrent to be deposited upon, and enter largely into, the composition of the tissues.

It was observed in a former note that carbonic acid gas tended to render chalybeate waters palatable, that those which contain little or no carbonic acid gas are most disagreeable, while the vitriolic or aluminated vitriolic chalybeate springs, such as those of Sandrock in the isle of Wight, Hartfell, or Vicar-Bridge, are absolutely repulsive. It would not be perhaps uninteresting to show a comparative table of a few of the most celebrated gaseous chalybeate springs, in order to an appreciation of their relative quantities of carbonic acid gas.

Pyrmont water	contains	44,920	cubic inches
Brückenau	—	33,500	—
Schwalbach	—	22,000	—
Spa (Pouhon)	—	21,680	—
Shotley-Bridge	—	1,250	—
Tunbridge	—	1,000	—

The chemical substances held in solution in a cha-

lybeate water are derived partly from the deep-seated mineral strata of the earth through which it passes, and partly from the saline substances, whether ferruginous or other, contained in the superficial soil. There have been made at various periods analyses of the Spa springs; the more recent one is by Monheim, a very distinguished German chymist, who for a long series of years devoted himself exclusively to the analysis of mineral waters; it appears to have been conducted with the minutest care and on the most thoroughly scientific principles.

The Table shows the proportion of the chemical constituents in a pint containing sixteen ounces.

1. — THE POUHON.

Carbonate of soda.	0.9055 gr.
Chloride of sodium.	0.2042
Carbonate of lime.	0.7500
Carbonate of magnesia.	0.3125
Carbonate of iron.	0.8750
Carbonate of alumina.	0.0312
Silica.	0.2812
Loss.	0.0154
	3.3750
Carbonic acid gas.	21.68 cub. in.

2. — THE GÉRONSTÈRE.

Carbonate of soda.	0.452 gr.
Chloride of sodium.	0.093
Sulphate of soda.	0.041
Carbonate of magnesia.	0.163
Carbonate of lime.	0.331
Carbonate of alumina.	0.014
Carbonate of iron.	0.456
Silicious acid.	0.107
	1.657
Carbonic acid gas.	14.164 cub. in.
Pyritous-smelling hydrogen gas	0.047 —

3. — THE SAUVENIÈRE.

Carbonate of soda.	0.301 gr.
Chloride of sodium.	0.062
Sulphate of soda.	0.075
Carbonate of lime.	0.220
Carbonate of magnesia.	0.107
Carbonate of alumina.	0.009
Carbonate of iron.	0.437
Silicious acid.	0.071
	1.282
Carbonic acid gas.	20.182 cub. in.
Pyritous-smelling hydrogen gas	0.028 —

4. — THE GROESBECK.

Carbonate of soda.	0.224 gr.
Chloride of sodium.	0.047
Sulphate of soda.	0.024

Carbonate of lime.	0.160 gr.
Carbonate of magnesia.	0.081
Carbonate of alumina.	0.007
Carbonate of iron.	0.245
Silicious acid.	0.048
	0.856
Carbonic acid gas.	21.625 cub. in.

5. — THE OLD TONNELET.

Carbonate of soda.	0.217 gr.
Chloride of sodium.	0.045
Sulphate of soda.	0.021
Carbonate of lime.	0.454
Carbonate of magnesia.	0.084
Carbonate of alumina.	0.007
Carbonate of iron.	0.591
Silicious acid.	0.042
	0.961
Carbonic acid gas.	22.042 cub. in.
Pyritous-smelling hydrogen gas.	0.014 —

6 — THE NEW TONNELET.

Carbonate of soda.	0.080 gr.
Chloride of sodium.	0.015
Sulphate of soda.	0.007
Carbonate of lime.	0.129
Carbonate of magnesia.	0.065
Carbonate of alumina.	0.007
Carbonate of iron.	0.250
Silicious acid.	0.027
	0.580
Carbonic acid gas.	19.786 cub. in.
Pyritous-smelling hydrogen gas.	0.004 —

Upon an attentive examination of the above tables it will be seen that the chemical properties of these waters are analogous; such also is their general action upon the human economy. In this latter respect, however, there are shades of difference (page 3), by no means so slight as the simple inspection of the comparative quantity and quality of their respective elements would lead the casual observer to conclude; on the contrary, we have here a remarkable instance of those occult properties of mineral springs which still baffle the researches of the most enlightened men of science; it is not therefore surprising that homœopathists have endeavoured to profit by this phenomenon to obtain support for one of their absurd doctrines, the developement of a new and energetic *power* by the act of trituration, the *spell*, no doubt, by which their magical cures are effected.

VII

Application in disease.

The foregoing note, which treats of the analysis of the chalybeate waters of Spa, in exposing their component elements, leads to the inference that they are capable of an extensive application in the treatment of disease, and such is in reality the case. It is not in the author's power to lay before the reader an analytical *aperçu* of their distinctive medicinal qualities based on observation and experience, in order to present a classification of those diseases to which they would individually be the best applicable. In vain, too, has he searched among the best authors who during the last two hundred years have treated upon the Spa waters; but, alas! all satisfactory data fail

upon which any such classification can possibly be grounded; all that can be said is, that all these springs do act differently even upon the same person. The divers effects produced by them appear to have less relation to the nature of the complaint itself than, if the expression be permitted, to the *individuality* of the sufferer. We are certainly in possession of many facts handed down to us calculated to aid us in our choice, but they can only be useful to the physician when, in addition to his own personal experience, they are supported by a scrutinizing investigation of his patient's temperament, constitution and idiosyncrasies.

It will be observed that their most important constituents, besides the carbonate of iron, are the carbonates of soda, lime and magnesia; the large quantity of carbonic acid gas held likewise in solution is particularly worthy of remark, as it is principally owing to the quantity of this gaseous fluid that their combination is so perfect, their affinities so well sustained, and their action upon the economy, particularly on the lymphatic, glandular and urinary systems, so peculiarly searching. It is likewise to the presence of this gas that the exhilarating effects of the Spa waters are due, an advantage they possess over all

English chalybeate springs, and which they maintain in common with the choicest mineral waters of their class upon the continent.

Their effect upon the economy depends upon the mode of their administration, whether external or internal. In the latter case they exhibit a general and a special action; their general action is due to the peculiar property of the metal itself and to its diluted solution in, and intimate combination with, the aqueous menstruum; it is stimulating, astringent and tonic. The *stimulating* effects result from the acceleration of the heart's contractions; the *astringent*, from the healthy modification of the relaxed muscular fibres of the intestines and, also, of the secreting functions of the mucous membranes by which the intestines are lined; the *tonic*, from the restoration of the red globules of blood to their normal state, that is to say, to their physiological or healthy condition, both as regards their quantity and quality, by which the process of reproduction of the constantly decaying elements of the animal frame is not only invigorated but steadily maintained.

Their special action is owing to the other active medicinal substances, besides the salt of iron, which, entering into the torrent of the circulation, effectually

penetrate into the viscera, particularly the liver and kidneys, and modify their secreting and excreting functions.

There is no part of the frame which the blood does not reach for the purposes of reparation, and to which it does not carry, independently of the red globules, a great number of organic substances, such, for example, as fat, albumen and fibrine, and a great number of alcaline and earthy particles. The parenchyma, therefore, or solid portion of the body, of course including all the viscera, is as susceptible of being modified when in a diseased condition by the presence of the earthy and alcaline salts which enter into the composition of the ingested mineral water, as are the red globules of the blood themselves by the iron which constitutes their most important element.

At watering places, unreflecting persons are often heard to exclaim against the efficacy of those mineral springs which are known to contain but minute quantities of active medicinal principles, asserting, with a sarcastic air, that they themselves have taken many beakers of the water without experiencing the least sensible effect! This sweeping condemnation of their efficacy would be but a matter of indifference to the public and the profession if it did not sometimes hap-

pen that persons who might be greatly benefited by their medicinal properties are thereby deterred from their employment, whilst others, by reason of such frivolity, are induced to make use of them with extreme incaution, thus entailing upon themselves serious and occasionally fatal consequences.

A Russian nobleman arrived in SPA, in the season of 1848, for the mere benefit of change of air, having passed the previous winter at Paris. Feeling himself rather low, and hearing that the SPA waters were stimulating and strengthening, and might be drunk with impunity, he began at once to take a course of them without any forethought or consideration; in about a week or ten days after, he fell down in what was supposed to be a fit of apoplexy. The author was immediately called in, but long before he could reach the hôtel, life had become extinct. This unfortunate gentleman's death was in all probability hastened by his imprudence; *he died from the bursting of an aneurism of the aorta;* it is not impossible that he might have continued to live on, months and even years, but for the increased vigor of the heart's contractions produced by the stimulating and tonic effects of the waters of the Pouhon. This single instance will suffice to show how extremely necessary it is to employ a

proper caution in making use of a mineral water when not sufficiently acquainted with its effects upon the system.

When the chalybeate waters of Spa are employed externally, they act through the skin as an organ of sensation, as an organ of absorption, and as an organ of secretion; in the first instance upon the nervous system, in the second upon the blood, in the third upon the sudoriparous glands which secrete the perspiration, and the sebiparous glands which secrete the oily fluid that gives to the skin its lustre, pliancy and softness.

The cutaneous secretion is in a great degree vicarious with the urinary, in respect to the amount of fluid eliminated, the urine being more watery as the cutaneous exhalation is less abundant, and *vice versâ*.

These two secretions or *excretions*, as they are sometimes considered, are equally vicarious with respect to the elimination of the worn-out particles of the body. According to Carpenter, the share which the skin has in this office has generally been too much under-rated. There is reason to believe, says that physiologist, that 100 grains of azotized matter are excreted from it daily. Any cause therefore which checks this excretion must throw additional labour on

the kidneys and will be likely to produce disorder of their function.

The experiments of Fourcault shew that a varnish applied over the skin of animals, so as to suppress completely the perspiration, gives rise to a state which he designates "cutaneous asphyxia," characterized by an imperfect arterialization of the blood and a considerable fall of temperature, and which, as it produces death in the lower animals, would probably do the same in man. The imperfect action, therefore, of the cutaneous glands, consequent upon inactive habits of life and want of ablution, is a very frequent source of disorder to the general system, occasioning the accumulation of that decomposed organic matter in the blood mentioned above, and being the more dangerous when, from any cause, the function of the kidneys is imperfectly performed. Few persons are aware of, or give proper consideration to, the connexion between the collective functions of the skin and those of the viscera, the derangement of either one of which will disturb that due equilibrium of organic action which constitutes health.

"Taken separately," says Erasmus Wilson, "the little perspiratory tube, with its appended gland, is calculated to awaken in the mind very little of the im-

portance of the system to which it belongs; but when the vast number of similar organs composing this system are considered, we are led to form some notion, however imperfect, of their probable influence on the health and comfort of the individual. I use the words 'imperfect notion', continues Wilson, advisedly, for the reality surpasses imagination and almost belief. To arrive at something like an estimate of the value of the perspiratory system in relation to the rest of the organism, I counted the perspiratory pores on the palm of the hand, and found 3528 in a square inch. Now each of these pores being the aperture of a little tube of about a quarter of an inch long, it follows that in a square inch of skin on the palm of the hand there exists a length of tube equal to 882 inches, or 73 1/2 feet. On the pulps of the fingers, where the ridges of the sensitive layer of the true skin are somewhat finer than in the palm of the hand, the number of pores, on a square inch, a little exceeded that of the palm; and on the heel, where the ridges are coarser, the number of pores on the square inch was 2268 and the length of tube 567 inches, or 47 feet. To obtain an estimate of the length of tube of the perspiratory system of the whole surface of the body, I think that 2800 might be taken as a fair average of

the number of pores in the square inch, and 700, consequently, of the number of inches in length. Now, the number of square inches of surface in a man of ordinary height and bulk is 2500; the number of pores, therefore, 7,000,000, and the number of inches of perspiratory tube 1,750,000, that is 145,833 feet or 48,600 yards, or nearly twenty-eight miles."

To resume, then, let it be considered that impressions of heat and cold are transfered from the skin to the central nervous system, whence they are reflected, when powerful, to the visceral and muscular systems; that through its agency, gases and fluids, whether healthful or noxious, may be absorbed into the economy; and lastly, that by its complex glandular structure a depuration of the blood takes place to throw off metamorphosed and useless materials, and it will be impossible not to arrive at the conclusion, that baths are in reality among the most important agents whether for the preservation of health or for the cure of disease. In the latter case the advantage of mineral baths is obvious, and the immense extent to which they are now employed can excite no astonishment.

In general, mineral-water baths are considered in the light of auxiliaries to the treatment, and their ad-

ministration either precedes, accompanies, or follows the internal use of the waters: but in many instances they are of primary importance and produce the most salutary effects where the system could not tolerate the ingestion of the latter. To employ them opportunely is the only way to arrive at good results, and as they are used under various forms, the choice of these must depend upon the nature and state of the patient's disorder, his temperament and oftentimes his idiosyncracies. The form under which they are employed may require to be varied either in accordance with a preconceived plan of treatment, in adapting them to those unforeseen changes which occur in regard to the patient's health, or in relation to atmospherical circumstances. Of equal moment is the temperature at which they are employed, and the duration of each bath; the degree, too, of intensity of action, as in the douche, and the patient's own movements where the undulating bath is required.

The mineral baths in use at Spa are: warm and cold general baths, warm and cold local baths, vapour baths, shower baths, douches, and mud baths

Hot baths are seldom employed at Spa and never rationally; yet not a season passes that persons treating themselves or imprudently modifying the tem-

perature prescribed by the physician, have not suffered from serious functional disturbance on this account. The irritation produced on the nervous papillæ of the skin by the very hot bath is conducted to the great nervous centres and reflected, of course, upon the viscera, whence arise violent arterial pulsation, throbbing at the heart, headaches, giddiness, sickness, and sometimes fainting.

If the maximum of a beneficial temperature be taken at 30° R., it is not so easy to define the precise range of temperature in which a bath is really, either warm, tepid or cool, on account of the greater or less sensibility of the skin in different individuals, arising from their natural organization, or morbid condition at the moment.

Thus, according to the ultimate effect desired to be obtained, must the physician explain as clearly as he can the immediate effect he desires the temperature to produce upon his patient, indicating the probable degree on the thermometrical scale, but allowing a certain latitude to the patient to increase or diminish it. It is of infinite consequence to regulate the temperature properly, for if the intention be to obtain a soothing effect upon the nervous system, and at the temperature prescribed, the patient should

become at all excited from the heat being rather too great, or that chilliness should ensue from the reverse, the attempt will signally fail; yet there is this peculiarity to be observed, that although a very slight excess of thermometrical temperature will oftentimes occasion unpleasant sensations of over-stimulation which the gradual cooling down of the bath will not altogether remove, a slight deficiency of the desired temperature will most frequently regulate itself, in a very short space of time, from the compensating effects, by stimulus to the skin, of the carbonic acid gas and the saline particles which the water holds in solution.

Again, where the absorptive function of the skin is to be called into action, it becomes equally important that the just degree of temperature should be acquired and sustained by which the entrance of the saline particles held in solution shall penetrate easily into the capillary circulation. The fact of imbibition, for a time denied by physiologists in consequence of the experiments of Sœmmering and Krause which attested that the epidermis was impermeable according to the laws of endosmosis and exosmosis, is now completely established by other physiologists who made their experiments upon the living subject, instead of

employing pieces of dead membrane. Thus. Westrumb detected the presence of ferrocyanate of potash in the urine of a man who had taken a bath which held this salt in solution; d'Arcet found the urine of a patient alcaline who had bathed in the Vichy waters; Cruikshanks demonstrated that by baths not only could thirst be quenched, but that the urinary secretion which had been exhausted by a want of liquid ingesta was resumed; Falconer found that his hand immersed to the wrist in warm water had imbibed 98 grains of moisture in the space of a quarter of an hour. The experiments of Collard de Martigny, of Berthold, and those, later, of even Krause himself have set the question definitively at rest. As a necessary consequence of the above important fact, it was desirable to establish the degree of temperature the most favorable to the process of absorption; this was however not so easy to determine; the results of the experiments of Berthold, of Madden and of Young, although presenting some discrepancy with regard to the exact point of the column of mercury, have nevertheless confirmed a certain range of temperature within which, alone, an active absorption takes place, the range not being the same, however, for every person.

This is, after all, but a seeming contradiction, for every individual has his own range according to the strength or debility of his frame and constitution, the activity or torpidity of his circulation, the thickness or thinness or, in other words, the greater or less permeability of his cuticular tissue; but for practical purposes it is sufficient to know that absorption does not take place at a temperature above that of the body, and that the most absorption-favoring temperature is, upon the average, about 26° of Reaumur's scale; below this last degree, the temperature soon begins to cause such contraction as opposes imbibition, while above blood-heat imbibition is rendered impossible by perspiration. Vapour baths are used with much effect in the treatment of a variety of chronic affections, particularly rheumatic and cutaneous. In others, douches are employed with great effect, as the mineral water increases their stimulating action; they are powerful or weak according to the results desired, and are administered under four distinct forms: the descending, the lateral, the ascending, and the drop douche. The two first are generally very powerful, but may be modified to produce the effect of the softest shower of rain; the third is used exclusively in uterine affections with most admirable results; the drop bath

is employed in some rare cases to produce a sort of equivalent to electric shocks.

Peat-baths were first introduced by the author into Spa in 1849; the knowledge of their immense value as a medicinal agent induced him to employ them in some cases he had selected of obstinate disease, such as chronic local rheumatism, certain cutaneous affections, and indolent ulcers of the leg.

The peat of this neighbourhood is extremely valuable, rich to a high degree in organic and inorganic substances, and naturally led to the inference that its medicinal effects would not fail to realize his expectations; in this he was not disappointed. He owes the following analysis to his friend Professor de Koninck, of the University of Liége, who engaged in the process the kind services of the eminent chymist Dr Steyn Parné.

QUALITATIVE ANALYSIS.

A. — Inorganic substances.

I. SOLUBLE IN WATER.

Potash.	Oxyde of iron.
Soda.	Sulphuric acid.
Lime.	Chlorine (traces).

II. SOLUBLE IN CHLORHYDRIC ACID.

Potash.	Magnesia (traces).
Soda.	Phosphoric acid.
Lime.	Sulphuric acid
Oxyde of iron.	Silicic acid.
Alumina.	

***B.* — Organic substances.**

Humic acid.	Cereous matter.
Humine.	Resinous matter.

QUANTITATIVE ANALYSIS.

1000 parts of peat dried at 90° centigrade are composed of

Inorganic matters soluble in water.	1.6	Potash.	4.6
		Soda.	12.4
		Lime.	15.5
		Oxyde of iron. . .	22.5
		Alumina.	34.5
Soluble in chlorhydric acid.	101.7	Magnesia.	traces
		Silicic acid.	3.1
		Sulphuric acid. . . .	5.6
		Phosphoric acid. . .	5.1
		Chlorine.	traces
	103.3		

Organic matters. . .	510.0	Humic acid. . . .	121.3
		Humine.	8.3
		Cereous matter. . .	5.2
		Resinous matter. . .	23.5
		Organic matters not determinable. . . .	351.7
Insoluble matters.			386.7
			1000.0

N. B. No account is taken of the carbonic acid and ammonia which are contained in this peat.

Nothing can surpass the agreeable and at the same time truly faithful description of the effect of peat-baths given by Dr. Suttro in his valuable treatise on the German mineral waters, published in London in 1851. « The sensation caused by a peat-bath is, in my opinion, the most pleasurable that can possibly be excited by any bath. The warm, unctious, elastic medium gives support, and yields at the same time to our moving limbs. However forbidding the black broth may look, if you are once seated in the baignoire, the agreeable titillating effect exercised by the semi-liquid mass on the peripheric ends of the nerves is extremely agreeable, and you leave it with regret, abridging the luxurious immersion by being warned of the danger of a too great prolongation. The stay is gra-

dually increased from a quarter of an hour to an hour. A warm-bath stands near the other in the same room and serves to relieve you of the adherent black mass. If you inspect yourself in the looking glass after leaving the peat-bath, you may well be frightened by the altered being you behold. After immersion in the water-bath, you observe the skin to have been wrinkled and loosened, just as if it had become too wide a covering for the body. Increase of appetite may be reckoned upon as an invariable follower of the moor-bath How useful these baths must prove," adds that author, " in excessive perspiration through cutaneous atony, in repelled eruptions, in arthritic and rheumatic disorders, etc., is too obvious to require further allusion. "

These baths are employed locally as well as generally; very commonly in the form of cataplasm.

It will now be necessary to point out those constitutional disorders in which it would be dangerous to employ the Spa waters, and those in which their efficacy is well attested.

They are counter-indicated in cases of plethora, where there is a tendency to apoplexy or active blood congestions, and in diseases of the heart and large arteries. They are to be avoided by persons of firm mus-

cular fibre, subject to occasional vertigo or giddiness in the head; by those who are liable to sudden ebullitions of passion and by those, too, who from visceral congestions, are subject to severe constipation or to accumulation of the secretions and excretions in the primæ viæ, unless these are first thoroughly cleared out.

Their employment is dangerous in fevers, particularly those of an inflammatory character; in hectic fever they would in all probability hasten the fatal termination.

They ought not to be administered to irritable persons who have tubercles in the lungs and in whom fever is easily lighted up, or who suffer from a dry hacking cough; to persons who are subject to active hemorrhage, no matter from what organ, or to females of strong constitution during the period of gestation. Lastly, their exhibition would be attended with doubtful, and even hazardous consequences, in cases of morbid transformation or degeneration of textures, particularly where important viscera are the seat of the disease, unless previous solvent remedies had been employed, or unless they are required as simple adjuvants during an appropriate course of treatment in order to sustain the system.

On the other hand, they are of remarkable efficacy in the following disorders :

I. Anemia or that condition of the system which is characterized by a deficiency of blood and an alteration of its constituent elements, as described in chapter IV.

II. Nervous affections, such as partial or even general paralysis, convulsive disorders and epilepsy; where there is a painful sensibility of the nerves, as in certain neuralgic complaints, and where, on the other hand, there is torpor of the nerves producing a defective tonicity of the muscular system, in which instance the muscles are flabby, are unable to sustain continued exertion and are irritable with the tremulousness of debility; this state is accompanied by a want of tone in the stomach and intestines which occasions indigestion, costiveness and flatulence. In these affections it has been discovered that the blood is in general very deficient in red globules.

III. Another class of nervous affections characterized by a perpetual inquietude, acute sensibility, irresolution, often sleeplessness, and an irritability of disposition which is often the reverse of the person's natural character; these persons are often, but erroneously, classed among hypochondriacs ; they are real

sufferers, but their sufferings are disregarded, or at most doubted, because of the perpetual change of seat of the disease; neither friends nor physicians can throw any light upon the peccant organ or organs which may lead to their discovery; sympathy for them is seldom real, yet few require it more, and their painful condition is usually enhanced by an ill-conceived and reckless system of drugging. It is remarkable what alleviation is felt by such persons through a judicious course of bathing in these mineral waters.

IV. Cachectic diseases or those in which there is a corruption of the fluids:

a. Typhus fever, when the patient has entered into the period of convalescence.

b. Tuberculous diseases, where there is no particular counter-indication. In the treatment of these diseases the SPA water may be favorably combined with the Kreutznach water which contains iodine and bromine.

c. Scorbutic disorders attended with constant hemorrhage; likewise purpura hemorrhagica.

d. Scrofulous disorders, a large and important class of affections in which the SPA waters combined with the Kreutznach waters, or administered conjointly with the iodide of iron, produce most admirable results.

e. Mercurial disease. The Spa waters are employed in this affection as an after-treatment when the patient has gone through a course of sarsaparilla or of the Aix-la-Chapelle or Kissingen waters. In no disorder is their efficacy, when thus employed, more positive than in this.

f. Vitiated state of the blood occasioned by long continued abuse of alcoholic drinks. This disease is characterized by the blood being at first darker and more fluid, deficient in fibrine, but containing a considerable quantity of fat corpuscles; rubbed between the tips of the fingers, it has a clammy, greasy feel, and, when left to stand, the serum or watery portion has a milky appearance. After a certain time, the globules lose their redness and dissolve with unusual celerity in the blood plasma in which the phosphoric salts abound. The patient complains of loss of appetite; his appearance is dejected; the tongue is furred; he is tormented by acid eructations, by heartburn and by a constant gnawing pain at the pit of the stomach; the skin has a dirty brown appearance and is sometimes covered with a red papular eruption; the whole nervous system is shaken, and not unfrequently the well known signs of delirium tremens set in to complicate still more his wretched condition. If the

disease has not progressed too far and the patient has resolution enough to relinquish his former habits, a full course of the Spa waters, aided by a generous diet, horse exercise and the enjoyment of the bracing air of the neighbouring mountains, will in some months bring him round into a state of perfect convalescence.

g. Gouty affections of a torpid and atonic character.

The leading symptoms are dyspepsia, flatulence, heartburn; sometimes constipation, at others looseness of the bowels; often passive hemorrhoïds; a peculiar puffed appearance of the face with discoloration of the skin; urine pale and copious, and a state of hypochondria or lowness of spirits. The pains in the articulations are much less severe than in acute gout and are often wanting altogether. The Spa waters, to produce their proper effect, require sometimes to be modified by saline mineral waters, among which the author has generally found the Ragozy the most efficacious; a conjoined course of tepid baths form an essential part of the treatment.

V. Catarrhal phthisis at its commencement.

VI. Passive hemorrhages in whatever organs they may occur, particularly irregular and profuse menstruation.

VII. Extreme debility occurring in delicate females during the first months of gestation. The Spa waters, by their sedative effect when combined with tepid bathing, while giving at the same time general tone to the system, diminish the liability to miscarriage.

VIII. Chronic diseases of all mucous membranes where the mucous secretion is abundant and there is a general laxity of fibre, particularly fluor albus or whites; a careful treatment by the internal and external administration of the waters generally restores the secreting surfaces, in this disease, to a healthy condition.

IX. Disorders of the kidney and bladder arising from imperfect sanguification and from general weakness of the system. In cases of gravel and in incipient calculous affections, the Sauvenière and Groesbeck still maintain their ancient reputation.

X. Worms, and especially the ascarides; the New Tonnelet and the Barisart are those most usually employed and with great success. Lavements of either of these waters may also be administered to disembarrass the large intestine, should there be any difficulty in getting children to take them inwardly.

XI. Amenorrhœa or retention of the monthly emission. With those females who at the same time

labour under general plethora or local congestions, the treatment should be commenced by the exhibition, for the first few days, of the Pülna or Seidschütz water.

XII. Sterility owing to exhaustion of the nervous powers from over-excitement, or to the debility attendant upon a torpid or atonic constitution. The water the most usually had recourse to in these cases, and which appears to have produced the most frequent and happiest results, is the Sauvenière.

XIII. Spermatorrhæa.

XIV. Chronic disease of the liver characterized by the following symptoms : a sensation of oppression at the region of the stomach immediately after meals; flatulence, heartburn and acid eructations, with occasional cramps of the stomach ; thirst, coated tongue with bitterness in the mouth upon first rising, false appetite and longing for acid drinks; occasionally, dull heavy pain in the region of the liver with sympathetic pain in the right shoulder; frequent inclination to vomit; sometimes severe constipation, at others troublesome diarrhœa; petulance and peevishness of temper, irresolution in matters of business, headache and depression of spirits. In this common and most distressing affection, particularly among those who have long resided in tropical climates and whose

liver and spleen have suffered from long continued engorgements from highly carbonized blood, the Spa waters are eminently useful. It is best to prepare the patient with a little blue pill and Gregory's powder if there be diarrhœa or great tendency to it, or with the Carlsbad water if constipation be present, and proceed afterwards, first with the Barisart and then with the Sauvenière, taking great care at the same time to regulate the action of the stomach and bowels. In these cases a conjoined and patiently sustained course of warm mineral-water bathing will produce very favorable results; the noxious particles which are constantly being eliminated from the blood and dissolve in the water of the bath are replaced by the chemical constituants of the water which promote in the system a more active assimilation and healthier metamorphosis of tissue.

XV. Atony or sluggishness of the bowels, particularly of the large intestine, accompanied most generally by venous congestion of the mesentery and torpor of the liver. Persons most subject to this disordered state of the functions are studious men and men of business who lead a sedentary life; females who have suffered from long and difficult parturition or of sedentary habits with tendency to hemorrhoïdal disease.

In these cases, the SPA waters are of singular efficacy and their favorable action is augmented, particularly in the beginning, by the Ragozy water of Kissingen.

VIII

Auxiliary mineral waters occasionally employed by the author in conjunction with the local springs.

1. — KREUTZNACH, ELISENQUELLE.

LOEWIG'S ANALYSIS.

In a pint of 16 *ounces.*

Chloride of sodium.	72.883 gr.
Chloride of calcium	13.389
Chloride of potassium.	0.624
Chloride of lithium.	0.613
Chloride of magnesium.	4.071
Bromide of magnesium.	0.278
Iodide of magnesium.	0.035
Carbonate of lime.	1.693
Carbonate of barytes.	0.017
Magnesia.	0.106

Oxyde of iron.	0.154 gr.
Phosphate of alumina.	0.025
Oxyde of manganese	0.006
Silica.	0.129
	94.023 gr.

2. — KISSINGEN, RAGOZY.

KASTNER'S ANALYSIS.

In a pint of 16 *ounces.*

Chloride of sodium.	62.05 gr.
Chloride of potassium.	0.91
Chloride of talcium.	6.85
Hydrochlorate of ammonia.	0.05
Iodide of talcium.	traces
Bromide of talcium.	0.70
Carbonate of soda.	0.82
Carbonate of lime.	3.55
Carbonate of talc-oxyde.	2.50
Carbonate of strontian.	traces
Carbonate of iron.	0.68
Carbonate of manganese. . . . . } Carbonate of lithic-oxyde. . . . . }	traces
Phosphate of soda.	0.17
Sulphate of soda.	2.00
Sulphate of lime.	2.50
Silica.	2.25
Alumina.	0.18
Organic extractive matter.	0.15
	85.36 gr.
Carbonic acid gas.	26.25 cub. in.

3. — SEIDSCHUTZ, HAUPTBRUNNEN.

STEINMAN'S ANALYSIS.

In a pint of 16 *ounces.*

Nitrate of talc-oxyde	20.274 gr.
Sulphate of talc-oxyde	78.735
Chloride of calcium	2.606
Carbonate of talc-oxyde	1.100
Sulphate of potash	22.932
Sulphate of soda	27.113
Sulphate of lime	2.496
Carbonate of lime	4.838
Carbonate of strontian	0.024
Carbonate of iron	0.108
Carbonate of manganese	0.028
Phosphate of alumina	0 018
Silica	0.061
Humus extract	0.385
	160.718 gr.
Carbonic acid gas	3.304
Atmospheric air	0.105

4. — PULLNAER.

STRUVE'S ANALYSIS.

In a pint of 16 *ounces.*

Sulphate of soda	123.800 gr.
Sulphate of potash	4.800
Sulphate of lime	2.800
Sulphate of talc-oxyde	93.086
Chloride of talcium	16.666

Carbonate of talc-oxyde.	6.406 gr.
Carbonate of lime.	0.770
Phosphate of lime.	0.003
Silica.	0.176
	248.507 gr.

In 100 cubic inches of this water there are 6.939 cub. in. of carbonic acid gas.

5. — CARLSBAD, SPRUDEL.

ANALYZED BY BERZELIUS.

In a pint of 16 *ounces.*

Sulphate of soda.	19.86916 gr.
Chloride of sodium.	7.97583
Carbonate of soda.	9.69500
Carbonate of strontian.	0.00737
Carbonate of lime.	2.37005
Carbonate of talc-oxyde.	1.36965
Carbonate of iron.	0.07780
Carbonate of manganese. . . .	0.00645
Phosphate of lime.	0.00169
Phosphate of alumina.	0.00246
Fluate of lime.	0.02458
Silica.	0.57715
	41.97719

6. — THE CONCENTRATED SALINES OF KREUTZNACH FOR BATHS,

ANALYZED BY G. OSANN.

In a pint of 16 *ounces.*

Chloride of calcium.	1577.71 gr.
Bromide of calcium.	388.72

Bromide of potassium.	92.82 gr
Chloride of magnesium.	38.44
Bromide of sodium.	154.10
Chloride of sodium.	60.34
Chloride of potassium.	17.30
Alumina and oxyde of iron. . . .	35.66
Acid and resinous matters with traces of iodine.	216.13
Water of crystallization and loss .	44.50
	2625.72 gr.

All the above waters and the invaluable concentrated salines of Kreutznach, which contain considerable quantities of iodine and bromine, so useful in scrofulous affections, chronic disease of the liver and engorgements of the glandular system, when administered in form of baths as an adjunct to the internal treatment of those diseases by the SPA waters, may be had of the importer *M. Lambert Tournay,* pharmacien, opposite the church. They may be safely relied on as genuine.

IX

Rules and cautions for invalids.

The usual seasons for drinking the Spa waters are the spring, summer and autumn; if the spring is early, they may be commenced about the middle of April; if not, at the beginning of May; those who come after the full season may continue to take them to the latter end of October.

Persons of lymphatic constitution who can well support the cold, and who principally require tonicity of fibre, may pass the entire winter at Spa and take the waters with great advantage. They should however only take them when the weather is fine and admits of active exercise in the open air; there

are many cases for which the winter cure is to be highly recommended when occurring in persons of lax fibre.

Invalids cannot be too much cautioned, before commencing a course of chalybeate waters, to address themselves, first of all, to one of the physicians of the place. There are few constitutions, or state of constitution, that can support a proper course of such waters without some preliminary treatment. It will also be found sometimes requisite to suspend momentarily the course, of the propriety of which the physician must be the best judge.

Persons subject to congestions of any kind, and in however mild a degree, should commence the cure by some gentle saline aperient, for which the Püllnaer or Seidschütz water is highly to be recommended.

When there is a tendency to diarrhœa, the invalid may be prepared by a few Gregory's powders or the following prescription :

℞ Tinct. rhæi c.
» cardam. c. aa ʒij
Inf calami arom. ℥vij
Conf. arom. ʒiv
Fiat mistura.

Take two tablespoonsful every three or four hours.

Where there is much acrid matter in the stomach and intestines, and the relaxation is of frequent occurrence, which is not uncommonly the case upon commencing these waters, the patient may have recourse to a four or five grain blue pill to be taken over night, a Gregory's powder in the morning, and then to the following medicine :

℞ Tinct. catechu
Sp. ammon. arom. aa ʒj
Mist. cretæ ʒvij
Syr. papav. alb. ʒvi.
Fiat mistura.

Take two tablespoonsful every two hours.

The waters, of course, should be suspended until the relaxation has completely subsided, and they should be recommenced with the addition to each tumbler of half a teaspoonful to a teaspoonful of the compound tincture of bark.

The Pouhon will lie heavy on some stomachs, in which case the patient may take a few peppermint lozenges or in each tumbler some twenty or thirty drops of the spirits of carraway; a good plan in such cases is to place the tumbler in a basin of hot water, to take off the extreme coldness; if neither of these

means should suffice, he may change the Pouhon water for that of the Barisart, which sits lightly on the stomach and is much more easily digested.

Invalids should retire early to rest, in order to rise early in the morning, and take a little gentle exercise between each tumbler of the spring. It is a great error to hasten the cure by large potations of these waters; few individuals can continue this practice for any length of time with impunity; head symptoms will supervene and the cure, in consequence, be retarded.

Two or three four-ounce beakers at intervals of ten minutes or a quarter of an hour before breakfast are quite sufficient for the first day or two. If the patient experiences no disagreeable effects from these, he may take two or three more beakers about noon, and afterwards gradually increase his potations, always being cautious to take no more water than the stomach can easily digest.

Persons of a very irritable stomach cannot always bear the quantity of carbonic acid gas contained in these waters. In such case, instead of drinking the water immediately it is drawn, they may allow it to remain a short time in the tumbler, in order that a portion of the gas may escape; or they may mix it with half the quantity of milk, gradually diminishing

the proportion of the latter until the stomach is accustomed to the stimulant.

Persons of a very irritable fibre or those who labour under the irritable form of scrofula are strenuously recommended to begin the cure by a few warm baths of the temperature of 95° Fahrenheit or 28° Réaumur, and even then, if the irritability of the constitution is not materially diminished, to continue them for some time after commencing the waters.

The invalid should carefully avoid all great bodily or mental fatigue. He should seek for diversions the most suited to his taste and indulge in them with prudence.

The best drink in general at dinner is claret, pure, or diluted with plain spring water; some constitutions require a more generous wine, in which case a glass or two of good old sherry is the wholesomest. On no account should the patient drink the strong aromatic Rhenish wines or Burgundies.

For breakfast the invalid should take coffee, not too strong; he may take tea in the evening; for lunch, a cup of vanilla-chocolate or a dish of bouillon with a rusk, or biscuit.

He should be careful not to be tempted at the tables d'hôte to partake of rich or stimulating dishes; he

should be particularly cautious of certain fish, such as eels and salmon; he may however safely eat the mountain trout with which this neighbourhood abounds. Fruit, too, should be approached with extreme caution and never eaten raw.

The patient should, as often as possible, make the tour of the springs at an early hour of the morning, and at the end of the treatment, he may take a beaker at each well, breakfasting at either the Geronstère or the Sauvenière; there is no mode of taking the waters more delightful or more salubrious. As the invalid commences the waters progressively as to quantity, he should terminate the cure in like manner and bear in mind that mineral waters frequently exhibit their curative properties by their after-effects; if his case therefore be truly one to which a course of chalybeate waters is best adapted, let him by no means be discouraged if the progress of his recovery should not be marked by so great an improvement of health as he had perhaps too sanguinely expected; many of the most brilliant cures effected by mineral waters, as is universally known, are those in which the patient experienced the least satisfaction or apparent amendment during the period of the course, nay, in which the constitution seemed to suffer great disturbance.

When, however, health, strength and a redundancy of animal spirits shall have returned during his sojourn here, I would recommend him, as a last prescription, a genuine Spa breakfast.

Much has been said and written of certain dainties and delicacies at favorite watering places, and I remember Dr. Granville's ecstasy at the new laid eggs, *brioches* and veal cutlets served up for his morning's meal at Ems. "Commend me," says the doctor, "commend me (though I am no *friand,* except for my reader's sake) to such a cutlet!" Allow me in my turn, also for my reader's sake, to recommend a Spa breakfast, as served up at the principal hôtels, with just the sort of appetite a walk up to the Sauvenière or Geronstère is calculated to give a convalescent.

What a contrast for the eye and appetite in the snowy damask; the bowl of alpine strawberries; the fine mountain trout; the dainty flavored, the unrivalled chop of Ardennes mutton; with coffee, tea, delicious rolls, cream, eggs and butter! I think it may be fairly doubted whether such a breakfast would not captivate the daintiest, the most fastidious sybarite!

LETTER FROM VENATOR.

My dear Doctor,

While you are endeavouring to persuade the public that there is nothing like Spa water for most of the ills that flesh is heir to, I really must set up against you the savant society of which I am a member, insuring health and strength to those who join it, without either mineral waters or any elaborate medical prescriptions.

I believe the recovery of health at Spa is more than half owing to the air of its mountains, and I therefore propose the invigorating sports of the field, which are afforded by a pack of hounds kept in this town, and the fine shooting over the extensive moors in the neighbourhood. A few hints upon the matter may not perhaps, after all, be foreign to the object of your

book, and you may put them into any form you please, if you think they can in any way avail the unfortunate in search of health.

I begin by informing you, though who knows it better than yourself? that the pack is supported by a society called the "Vénerie ardennaise" composed of noblemen and gentlemen of this country, with a fair sprinkling of foreigners including some half dozen Englishmen.

This society keeps up an establishment everyway worthy of notice; fifteen to twenty couples of stout working harriers, selected from various packs in England, hunting a country something like Dartmoor, consisting mostly of heath, with some cultivated country, but little or no fencing.

The district in which the hares are bred renders them stout beyond the belief of an English sportsman. —Fifty minutes without a check, eight or nine miles straight on end are no uncommon runs. The hounds are kept by subscription, the English and other strangers being admitted as honorary members at a moderate annual sum. The main expenses are borne by the gentlemen of the country.

The liberality, good fellowship and hospitality of this hunt is proverbial.

The hounds are managed by the grand-maître Mr Farrer, who formerly kept a pack of boar and wolf hounds for many years in Touraine; he hunts them assisted by two whips.

The old French horn is used, carried over the shoulder and under the arm, and however much I laughed at first at this primæval equipment, I have long since learned to admire the horn and the *fanfares* in this wild and picturesque country. And now a few words on the subject of the horn and the far-famed fanfares or musical accompaniments to the hunt. On arriving at cover side, two or three notes are blown by the huntsman which sets the hounds to work. Instead of our English cry "Yoicks! push him up!" while drawing, which in these hills would be scarcely heard, a few more notes are sounded. When a find takes place, a short air is blown instead of "Gone away," and the hounds are encouraged by a peculiar note of the horn from time to time during the run.

The advantage of the horn in this country has been acknowledged by some of our best English sportsmen, and there really is something exciting in its sound. It has often brought to my mind that our forefathers thus hunted, as many an old print and picture proves:

in fact there are in the town two old English hunting horns bearing on the inscription the maker's name : "John Christopher Hoffmaster, in the Piccadilly, 1740."

I assure you, learned Doctor, my heart has often leaped with joy, when, after a sharp run of some forty or fifty minutes over this wild country, three or four good ones, only, with the hounds, I have heard the fanfare proclaiming the death or *mort*, and coming home listened, on entering the town, to the pretty air of the "*Vénerie ardennaise.*"

Other fanfares referring to local circumstances and passing events have been written and are frequently played by the horns of the V. A. — One, the *Adieu to Beauchamps,* the beautiful château of the prince A. de Chimay, is remarkably pretty and was composed in honor of the noble châtelaine upon the members of the Spa hunt taking leave of this amiable princess after being hospitably entertained, a few years ago, at Beauchamps, for a whole month.

The title *Vénerie ardennaise* signifies the hunt of the Ardennes; the buttons bear the motto "*Rallie Ardennes,*" in allusion to the hounds rallying on the scent. I think, however, I have said enough of this favorite hunt, and would now say a few words upon

another pack kept by Count Corneliessen, in the very best manner and at his sole expense.

The Count hunts them at Viel-Salm over a capital country which may be reached from Spa in about three hours. Strangers who are invited by the Count to hunt usually put up at the Hôtel de Bellevue. This hôtel is much frequented by sporting excursionists, the landlord holding at the disposition of his guests a goodly extent of country well stocked with game and intersected by a capital trout stream.

Thus if your patient pleases to hunt at Spa, he rides with the *Vénerie ardennaise;* if he prefers hunting completely English fashion, he goes out with Count Corneliessen, and if he does not please to hunt at all for the benefit of his health, why, he may alter his mind, after trying the steel waters and the doctor!

Your faithful friend,

VENATOR.

LETTER FROM PISCATOR.

DEAR DOCTOR,

As I understand one of our sporting friends has so highly rated the advantages and health-restoring effect of the hills surrounding SPA, in a letter he has recently addressed you upon the subject of the chase, allow me, as a humble disciple of good old Isaac, to say a few words of praise in favour of its neighbouring valleys, through which flows many a sunny stream, and where a lover of the gentle craft may pass an occasional hour with profit to his basket and, above all, refreshment to his eyes. For none like the flyfisher finds his way so readily among those magnificent valleys of the rivers Amblève and Hoegne which wind through the hills between the frontiers of Prussia and their respective embouchures in the Ourthe and

Vesdre. Now, talking of scenery, you will say, is not flyfishing, but the two are so connected in my opinion that it would be difficult for a sportsman to write of the one without alluding to the other; as I propose, however, to put pen to paper for the benefit of your, to be hoped, many readers, I shall confine myself to the piscatory qualities of the streams within nine miles of SPA.

The nearest stream to SPA which contains trout and grayling is the Hoegne, a small one, running from the moors upon the frontiers of Prussia through the commune of Sart, passing by the woods and mill of Jalhay, by Sart and Polleur, and falling at Franchimont into the Wahay, a beautiful but almost troutless stream, which descends through SPA; the stream resulting from their confluence empties itself at Pepinster into the river Vesdre. This lovely little stream, if fished from the middle of April to the middle of June, will afford very fair sport, and not to deceive or exaggerate, I fairly say, I never killed more than nine or ten brace of trout in a day, the biggest not exceeding a pound. I have seen and heard of fish of two and even three pounds taken there, but *they* never fancied *my* fly. The stream should be fished from as near the frontier as the

fisherman chooses to walk or ride, down to Polleur, the river becoming from that village covered with mills and factories, determined enemies to trout.

After having tried this stream and returned to Spa to boast of his success or bewail his ill luck, the fisherman must find his way to the Amblève, and, to begin within a reasonable distance of Spa, must go to the mill at Tagnion, about nine miles off. If he be a determined lover of the angle, he may start from Spa in the evening, eat eggs and bacon at the little village upon his arrival, at some honest farmer's, where he will probably be enabled without difficulty to get a bed. To do this, he had better have recourse to one of the numerous guides of the place, who, it is not unlikely, will cajole him out of a franc or two, but in the end render him a real assistance, or he may apply to one or other of his countrymen resident here, and I do not know one who would not have pleasure to direct him and even accompany him upon his first voyage of discovery.

And now for the fish; he will begin at the fall of water below the mill, where he will most likely kill a brace or two of trout of fair weight and will probably hook a few grayling. He will then fish with various success the broad stream till he gets below the village

of Tagnion. Before arriving there, he will have found out that the stream is full of a small but delicate fish, the parr or samlet, here called the *élan,* about six to eight inches long and about six to eight to the pound; probably he will have hooked some twenty of them. In the pool by the village, he will most likely kill more than one brace of fine trout and perhaps be annoyed by a great rascally chub; but if a fellow of four or five pounds, not an unusual weight for these gentry, he may find some consolation in having severely tested his tackle. This part of the river abounds in deep holes, and, if our fisherman is a master of the art, there is no reason why he should not get a chance of landing one or more of the great hooknosed salmon trout, weighing from four to fourteen pounds, who are particularly fond of taking up their quarters there. If he be bent, however, on killing a brace or two of the latter, I would strongly recommend him, and I appeal to you, Doctor, as an old and experienced craftsman, I would recommend him, I say, to change his tackle and spin a minnow with a great length of line. The best time I have found for this is from three to seven in the morning in the height of summer; rather *matinal* for the sportsman, I avow, but most killing for our hooknosed

friends. The fly and minnow are both allowed by the local authorities.

I forgot to say that my custom at Tagnion is to lay out a few eel lines on the night of my arrival before turning in, the chances being that I find at least one or two of these slippery gentry, or perhaps a handsome pike, when I visit my lines early the next morning.

If after the toils of the day the gentle craftsman be not anxious to reach Spa by this his second evening, I would advise him to apply to my one-legged friend the ferryman, who will put him across the stream next morning, and he may stroll quietly for about three miles up the beautiful and romantic valley of the Lienne, an excellent trout stream. I would further counsel him to sleep another night at Tagnion, and then fish down stream right on end to Quarreux; he will most likely have good sport; at all events he will pass through scenery not unworthy of Switzerland, and equal to the finest portions of the Sachsicher Schweitz, to which this part of the country bears the greatest resemblance. At Quarreux he can get a decent bed at the forest keeper's, Charlier, or he may push on to Remouchamps and visit the famous grot and the picturesque château of Montjardin; he will

here sleep at the *hôtel des Étrangers,* and will find himself once more in the haunts of civilisation. A visit to the château of the famous Boar of the Ardennes, Guillaume de la Marck, a mile lower down, would alone suffice to render this excursion worth his while, and he may kill a salmon trout in the pool below Montjardin as I have done before him.

Your's, dear Doctor, ever faithfully,

PISCATOR.

ALPHABETICAL LIST

OF

PLANTS GROWING IN THE NEIGHBOURHOOD

OF SPA.

A

Acer	Platanoïdes.
Acer	Campestres.
Achillea	Millefolium.
—	Ptarmica.
Ægopodium	Podagraria.
Æscalus	Hippocastanum.
Æthusa	Cynapium.
Agrimonia	Eupatoria.
Agrostemma	Githago.
Aira	Cespitosa.
Ajuga	Pyramidalis.
—	Reptans.
Alchemilla	Vulgaris.
Alisma	Plantago.
Alopecurus	Fulvus.
Alsina	Media.
Althæa	Officinalis.
Anagallis	Arvensis.
Andromeda	Polyfolia.
Anemone	Nemorosa.
Angelica	Archangelica.
Anthemis	Arvensis.
—	Cotula.
Anthericum	Liliago.
-	Ossifragum.
Anthoxanthum	Odoratum.
Anthirrinum	Simplex.
—	Linaria.
Apium	Graveolens.
Arctium	Lappa.
—	Barduna.
Arenaria	Cespitosa.
Arnica	Montana.
Artemisia	Vulgaris.
—	Absynthium.
Arum	Maculatum.
Arundo	Phragmites.
Asclepias	Vincetoxicum.
Asplenium	Ceteracha.
—	Trichomanes.
Athamanta	Meum.
Atriplex	Hortensis.
—	Angustifolia.

B

Ballota	Nigra.
—	Sepium.
Bellis	Perennis.
Berberis	Vulgaris.
Beta	Vulgaris.
Betonica	Officinalis.

Betonica	Montana.
—	Hirsuta.
Betula	Alnus.
—	Alba.
Borrago	Officinalis.
Brassica	Oleracea.
Briza	Media.
Bromus	Secalinus.
—	Giganteus.
Bryonia	Dioïca.

C

Campanula	Rotundifolia.
—	Persicifolia.
—	Rapunculoïdes.
—	Hederacea.
—	Speculum.
Cannabis	Sativa.
Cardamine	Pratensis.
—	Nemorosa.
Carduus	Lanceolatus.
—	Nutans.
Carex	Schreberi.
—	Biligularis.
—	Panicea.
—	Acuta.
Carlina	Vulgaris.
Carpinus	Betulus.
Centaurea	Montana, 2 var.
—	Scabiosa.
—	Cyanus.
Cerastium	Aquaticum.
Chærophyllum	Sylvestre.
Cheirantus	Cheiri.
Chelidonium	Majus.
Chenopodium	Album.
—	Viride.
Chironia	Centaurium.
Chrysanthemum	Leucanthemum.
—	Sagetum.
Chrysocoma	Zinosyris.
Cichorium	Intybus.
Circæa	Intermedia.
—	Alpina.
Clematis	Vitalba.
Cochlearia	Officinalis.
Colchicum	Autumnale.
Convallaria	Majalis.
—	Verticillata.
—	Polygonatum.
—	Multiflora.
Convallaria	Bifolia.
Convolvulus	Arvensis
—	Sepium.
Conyza	Squarrosa.
Cornus	Mascula.
—	Sanguinea.
Corylus	Avellana.
Crataegus	Aria.
—	Torminalis.
—	Oxiacantha.
—	Oxiacanthoïdes.
Cucubalus	Behen.
Cytisus	Hyburnum.

D

Dactylis	Glomerata.
Daphne	Mezereum.
Datura	Stramonium.
Daucus	Carota.
Delphinium	Consolida.
—	Ajacis.
Digitalis	Purpurea.
—	Albiflora.
—	Lutea.
Drosera	Rotundifolia.
—	Longifolia.

E

Echium	Vulgare.
Epilobium	Angustifolium.
—	Roseum.
—	Palustre.
Equisetum	Sylvaticum.
—	Arvense.
—	Palustre.
Erica	Tetralix.
—	Vulgaris.
—	— var.
Eriophorum	Angustifolium.
—	Vaginatum.
Ervum	Hirsutum.
Erysimum	Officinale.
Eupatorium	Cannabinum.
Euphorbia	Peplus.
—	Helioscopia.
Euphrasia	Officinalis.
—	Nemorosa.
—	Odontites.
—	Europœa.

F

Fagus	Castanea.
—	Sylvatica.
Festuca	Fluitans.
—	Rubra.
Fraxinus	Excelsior.
Fumaria	Officinalis.
—	Media.

G

Galega	Officinalis.
Galeopsis	Grandiflora.
—	Angustifolia.
—	Tetrahita.
—	Galeopdolon.
Galium	Harcynicum.
—	Elatum.
—	Verum.
—	Aparine.
Genista	Anglica.
Gentiana	Pneumonanthe.
Geranium	Prostratum.
—	Molle.
—	Pusillum.
—	Dissectum.
Geum	Urbanum.
Glecoma	Hederacea.
—	Magna.
Gnaphalium	Dioicum.
—	Sylvaticum.

H

Hedera	Helix.
—	Humirepens.
Hedysarum	Onobrychis.
Helianthus	Tuberosus.
Helleborus	Viridis.
—	Fœtidus.
Hieracium	Murorum.
—	Sylvaticum.
Holcus	Zanatus.
—	Mollis.
Hordeum	Murinum.
Humulus	Lupulus.
Hydrocotyle	Vulgaris.
Hyoscianus	Niger.
Hypericum	Dubium.
—	Perforatum.
—	Humifusum.
—	Pulchrum.
Hypochœris	Maculata.
—	Radicata.
Hyssopus	Officinalis.

I

Impatiens	Noli-tangere.
Iris	Pumila.

J

Jasione	Montana.
Juglans	Regia.
Juncus	Effusus.
—	Squarrosus.
—	Sylvaticus.
Juniperus	Communis.

L

Lactuca	Sativa.
Lamium	Album.
—	Purpureum.
Lapsana	Communis.
Lathyrus	Pratensis.
Leontodon	Taraxacum.
—	Autumnale.
Leonurus	Cardiaca.
Lepidium	Sativum.
Ligustrum	Vulgare.
Limosella	Aquatica, var.
Linum	Usitatissimum.
—	Tenuifolium.
Lithospermum	Officinale.
—	Arvense.
Lonicera	Periclymenum.
Lotus	Corniculatus.
—	Uliginosus.
Lunaria	Rediviva.
Luzula	Albida.
—	Maxima.
—	Campestris.
Lychnis	Flos-cuculi.
—	Viscaria.
—	Sylvestris.
Lycopodium	Clavatum.
Lycopus	Europœus.
Lysimachia	Vulgaris.
—	Nemorum.
—	Numnularia.
Lytrum	Salicaria.
—	Virgatum,

M

Malva	Sylvestris.
—	Rotundifolia.
—	Alcea.
Matricaria	Parthenium.
Medicago	Sativa.
—	Lupulina.
Melampyrum	Arvense.
—	Pratense.
Melica	Cœrulea.
Melissa	Officinalis.
—	Grandiflora.
Mentha	Rotundifolia.
—	Aquatica.
—	Sativa.
—	Arvensis.
Menyanthes	Trifoliata.
Mercurialis	Perennis.
—	Annua.
Mespilus	Germanica.
Montia	Fontana.
Myosotis	Annua, 2 var.
—	Perennis.

N

Narcissus	Pseudo-Narcissus.
Nepeta	Cataria.
Nasturium	or Sysimbrium Sylvestre

O

Œnethera	Biennis.
Ononis	Antiquorum.
—	Spinosa.
Ophris	Nidus-avis.
Orchis	Bifolia.
—	Latifolia.
—	Maculata, var.
—	Conopsea.
Origanum	Vulgare.
—	— humile.
Ormus	Ulmus, 2 sorts.
Orobus	Niger.
—	Tuberosus.
Oxalis	Acetosella.
—	Stricta.

P

Papaver	Rhœas.
—	Dubium.
Phalaris	Arundinacea.
Philadelphus	Coronarius.
Phleum	Pratense.
—	Nodosum
Phyteuma	Spicata.
Pisum	Arvense.
Plantago	Major.
—	Media.
—	Lanceolata.
Poa	Trivialis.
Polygala	Vulgaris.
—	Major.
Polygonum	Bistorta.
—	Hydropiper.
—	Aviculare.
—	Fagopyrum.
—	Convolvulus.
Polypodium	Vulgare.
—	Phegopteris.
—	Oreopteris.
—	Filix-mas.
—	Filix-fœmina.
—	Fragile.
—	Aristatum.
Populus	Canescens.
—	Tremula.
—	Nigra.
Potamogeton	Natans.
Potentilla	Anserina.
—	Argentea.
—	Recta.
Primula	Veris.
—	Elatior.
Prunella	Vulgaris.
Prunus	Padus.
—	Cerasus.
—	Avium.
—	Domestica.
—	Insititia.
—	Spinosa.
Pteris	Aquilina.
Pulmonaria	Officinalis.
—	Montana.
—	Grandiflora.
Pyrola	Rotundifolia
Pyrus	Malus.

Q

Quercus	Robur.
—	Sessiliflora.

R

Ranunculus	Flammula.
—	Ficaria.
—	Repens.
—	Polyanthemos.
—	Acris.
—	Arvensis.
Raphanus	Raphanistrum.
Reseda	Luteola.
—	Lutea.
Rhamnus	Frangula.
Rhinanthus	Villosus.
Ribes	Rubrum.
—	Alpinum.
—	Nigrum.
—	Grossularia.
—	Uva-Crispa.
—	Petræum.
Rosa	Arvensis.
—	Canina.
—	Dumetorum.
Rubus	Idæus.
—	Cæsius.
—	Fruticosus.

S

Salix	Ulmifolia.
—	Fragilis.
Sambucus	Ebulus.
—	Nigra.
—	Racemosa.
Saponaria	Officinalis.
—	Vaccaria.
Satureia	Hortensis.
Scabiosa	Succisa.
—	Arvensis.
—	Columbaria.
Scherardia	Arvensis.
Scrophularia	Nodosa.
Scutellaria	Minor.
Secale	Cereale.
Sedum	Reflexum.
—	Album.
—	Acre.
Sempervivum	Tectorum.
—	Montanum.
Senecio	Vulgaris.
—	Jacobæa.
—	Erucæfolius.
Senecio	Sarracenicus.
—	Viscosus.
Serratula	Arvensis.
Sinapis	Arvensis.
Sisymbrium	Nasturtium.
Sium	Nodiflorum.
Solanum	Tuberosum.
—	Nigrum.
—	Villosum.
Solidago	Virga-aurea, 2 var.
Sonchus	Oleraceus.
—	Arvensis.
Sorbus	Aucuparia.
Spartium	Scoparium.
Spinacia	Aleracea.
Spiræa	Ulmaria.
Stachys	Sylvatica.
—	Palustris, var.
—	Arvensis.
Stellaria	Holostea.
—	Graminea.
—	Alsine.
Symphytum	Officinale.

T

Tanacetum	Vulgare.
	— Crispum.
Taxus	Baccbata.
Teucrium	Botrys.
—	Scordium.
—	Chamædrys.
Thlaspi	Bursa-Pastoris.
Thymus	Serpyllum.
—	Acinus.
Tilia	Europœa.
—	Parvifolia.
Tormentilla	Erecta.
Trientalis	Europœa.
Trifolium	Melilotus.
—	Repens.
—	Medium.
Triglochin	Palustre.
Triticum	Æstivum.
—	Hybernum.
—	Spelta.
Tussilago	Farfara.
—	Petasites.

U

Ulmus	Campestris.

Urtica	Urens.
—	Dioïca.

V

Vaccinium	Myrtillus.
—	Uliginosum.
—	Vitis-Idæa.
—	Oxicoccos.
Valeriana	Dioïca.
—	Officinalis.
Verbascum	Thapsus.
—	Thapsoïdes.
—	Alopecurus.
—	Lychnitis.
Veronica	Beccabunga.
—	Chamædrys.
—	Officinalis.
Vicia	Cracca.
—	Sativa.
—	Faba.
—	— Minor.
Verbena	Officinalis.
Vinca	Minor.
Viola	Hirta.
—	Canina.
—	Lutea.
—	Tricolor.
—	Arvensis.
—	Palustris
Viscum	Album.

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